THE RANCH PLAN PLANNED COMMUNITY

PLANNING AREAS 3 AND 4 RUNOFF MANAGEMENT PLAN

Michael Baker INTERNATIONAL

TECHNICAL APPENDIX C.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:




 ************************ DESCRIPTION OF STUDY *************************
* GOBERNADORA WATERSHED STUDY - RATIONAL METHOD                        *
* REGIONAL WATERSHED S33- FREE DRAINING - ULTIMATE CONDITION           *
* 2-YR EV AUGUST 2018 ROKAMOTO                                        *
 ************************************************************************

  FILE NAME: RU02EV33.DAT
  TIME/DATE OF STUDY: 14:18 08/29/2018
============================================================================
  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;  1.600
   2)   10.00;  1.060
   3)   15.00;  0.840
   4)   20.00;  0.720
   5)   25.00;  0.630
   6)   30.00;  0.560
   7)   40.00;  0.480
   8)   50.00;  0.420
   9)   60.00;  0.366
  10)   90.00;  0.300
  11)  120.00;  0.246
  12)  180.00;  0.190
  13)  360.00;  0.136
  14) 1200.00;  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 0.0312 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)
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    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: S31X02.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      170.57   51.53  0.60( 0.49) 0.81    2407.7   13100.00
      2      195.69   91.33  0.60( 0.48) 0.81    3776.8   13000.00
      3      193.58   94.68  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: S32X02.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   52.96  0.60( 0.49) 0.82    1090.8   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   52.96  0.60( 0.49) 0.82    1090.8   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   52.96    0.404  0.60( 0.49) 0.82    1090.8   13200.00
      2       65.38   59.51    0.369  0.60( 0.50) 0.83    1127.6   13210.00
  LONGEST FLOWPATH FROM NODE  13200.00 TO NODE  13222.00 =   16821.05 FEET.
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** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
 NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
    1       170.57   51.53    0.412  0.60( 0.49) 0.81    2407.7   13100.00
    2       195.69   91.33    0.298  0.60( 0.48) 0.81    3776.8   13000.00
    3       193.58   94.68    0.292  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       241.09   51.53    0.412  0.60( 0.49) 0.81    3469.1   13100.00
    2       242.59   52.96    0.404  0.60( 0.49) 0.81    3547.6   13200.00
    3       240.98   59.51    0.369  0.60( 0.49) 0.81    3809.6   13210.00
    4       248.47   91.33    0.298  0.60( 0.49) 0.81    4904.4   13000.00
    5       245.29   94.68    0.292  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) =      248.47  Tc(MIN.) =   91.333
EFFECTIVE AREA(ACRES) =   4904.45  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.

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FLOW PROCESS FROM NODE  13222.00 TO NODE  13222.00 IS CODE =  12
----------------------------------------------------------------------------
>>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
FLOW PROCESS FROM NODE  13222.00 TO NODE  13222.00 IS CODE =  12
----------------------------------------------------------------------------
>>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
FLOW PROCESS FROM NODE  13222.00 TO NODE  13301.00 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    427.51  DOWNSTREAM(FEET) =    382.00
CHANNEL LENGTH THRU SUBAREA(FEET) =  2533.33   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) =  0.287
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED              -        1.40      0.60     0.100     -
USER-DEFINED              -       15.60      0.60     1.000     -
USER-DEFINED              -        0.10      0.60     0.600     -
USER-DEFINED              -        5.30      0.60     1.000     -
USER-DEFINED              -        0.20      0.60     1.000     -
USER-DEFINED              -       22.60      0.60     0.100     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
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SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.521
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     251.26
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.94
AVERAGE FLOW DEPTH(FEET) =   3.47   TRAVEL TIME(MIN.) =   6.08
Tc(MIN.) =   97.42
SUBAREA AREA(ACRES) =    45.20       SUBAREA RUNOFF(CFS) =    5.58
EFFECTIVE AREA(ACRES) =   4949.65     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) =     4969.6         PEAK FLOW RATE(CFS) =     248.47
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  3.46   FLOW VELOCITY(FEET/SEC.) =   6.92
LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13301.00 =   34659.82 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
MAINLINE Tc(MIN.) =   97.42
*   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.287
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED              -        1.00      0.60     1.000     -
USER-DEFINED              -        0.50      0.60     1.000     -
USER-DEFINED              -        7.40      0.60     0.100     -
USER-DEFINED              -        4.70      0.60     1.000     -
USER-DEFINED              -        2.90      0.60     1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.596
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
SUBAREA AREA(ACRES) =   16.50      SUBAREA RUNOFF(CFS) =    1.72
EFFECTIVE AREA(ACRES) =   4966.15   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) =     4986.1       PEAK FLOW RATE(CFS) =     248.47
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
MAINLINE Tc(MIN.) =   97.42
*   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.287
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED              -        1.30      0.60     1.000     -
USER-DEFINED              -        0.20      0.60     0.100     -
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  USER-DEFINED               -        5.30      0.60     1.000     -
  USER-DEFINED               -        0.30      0.60     1.000     -
  USER-DEFINED               -        0.20      0.60     1.000     -
  USER-DEFINED               -        0.60      0.60     1.000     -
  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.
  SUBAREA AREA(ACRES) =    7.90      SUBAREA RUNOFF(CFS) =    0.05
  EFFECTIVE AREA(ACRES) =   4974.05   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) =     4994.0       PEAK FLOW RATE(CFS) =     248.47
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   97.42
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.287
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        4.30      0.60     1.000     -
  USER-DEFINED               -        0.80      0.60     1.000     -
  USER-DEFINED               -        1.10      0.60     1.000     -
  USER-DEFINED               -        6.90      0.60     1.000     -
  USER-DEFINED               -        7.90      0.60     1.000     -
  USER-DEFINED               -        1.00      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.
  SUBAREA AREA(ACRES) =   22.00      SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   4996.05   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) =     5016.0       PEAK FLOW RATE(CFS) =     248.47
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   97.42
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.287
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        0.40      0.60     1.000     -
  USER-DEFINED               -       14.60      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.
  SUBAREA AREA(ACRES) =   15.00      SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   5011.05   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) =     5031.0       PEAK FLOW RATE(CFS) =     248.47
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  31100.00 TO NODE  31101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   317.00
  ELEVATION DATA: UPSTREAM(FEET) =    801.00  DOWNSTREAM(FEET) =    685.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.641
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.207
  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
  "CHAPARRAL,BROADLEAF"      -        0.50      0.60     1.000     0    8.64
  NATURAL FAIR COVER
  "OPEN BRUSH"               -        0.30      0.60     1.000     0    8.64
  NATURAL FAIR COVER
  "OPEN BRUSH"               -        0.30      0.60     1.000     0    8.64
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      0.60
  TOTAL AREA(ACRES) =      1.10   PEAK FLOW RATE(CFS) =      0.60

****************************************************************************
  FLOW PROCESS FROM NODE  31101.00 TO NODE  31102.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    685.00  DOWNSTREAM(FEET) =    655.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   135.00   CHANNEL SLOPE =  0.2222
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.152
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        0.50      0.60     1.000     -
  USER-DEFINED               -        0.10      0.60     1.000     -
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  USER-DEFINED               -        0.70      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) =       0.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.41
  AVERAGE FLOW DEPTH(FEET) =   0.26   TRAVEL TIME(MIN.) =   0.51
  Tc(MIN.) =    9.15
  SUBAREA AREA(ACRES) =     1.30       SUBAREA RUNOFF(CFS) =    0.65
  EFFECTIVE AREA(ACRES) =      2.40     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        2.4          PEAK FLOW RATE(CFS) =       1.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.29   FLOW VELOCITY(FEET/SEC.) =   4.64
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31102.00 =     452.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31102.00 TO NODE  31103.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    655.00  DOWNSTREAM(FEET) =    630.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   203.00   CHANNEL SLOPE =  0.1232
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   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               -        0.30      0.60     1.000     -
  USER-DEFINED               -        0.10      0.60     1.000     -
  USER-DEFINED               -        1.90      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) =       1.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.09
  AVERAGE FLOW DEPTH(FEET) =   0.37   TRAVEL TIME(MIN.) =   0.83
  Tc(MIN.) =    9.98
  SUBAREA AREA(ACRES) =     2.30       SUBAREA RUNOFF(CFS) =    0.96
  EFFECTIVE AREA(ACRES) =      4.70     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        4.7          PEAK FLOW RATE(CFS) =       1.96

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.39   FLOW VELOCITY(FEET/SEC.) =   4.25
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31103.00 =     655.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31103.00 TO NODE  31104.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    630.00  DOWNSTREAM(FEET) =    605.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   321.00   CHANNEL SLOPE =  0.0779
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
```

HZ-31102

HZ-31103

```
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.000
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        1.10      0.60     1.000     -
  USER-DEFINED               -        2.50      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) =       2.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.83
  AVERAGE FLOW DEPTH(FEET) =   0.48   TRAVEL TIME(MIN.) =   1.40
  Tc(MIN.) =   11.37
  SUBAREA AREA(ACRES) =     3.60       SUBAREA RUNOFF(CFS) =    1.30
  EFFECTIVE AREA(ACRES) =      8.30     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        8.3          PEAK FLOW RATE(CFS) =       2.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.50   FLOW VELOCITY(FEET/SEC.) =   3.97
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31104.00 =     976.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31104.00 TO NODE  31105.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    605.00  DOWNSTREAM(FEET) =    585.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   288.00   CHANNEL SLOPE =  0.0694
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   2 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               -        0.70      0.60     1.000     -
  USER-DEFINED               -        0.60      0.60     1.000     -
  USER-DEFINED               -        3.00      0.60     1.000     -
  USER-DEFINED               -        2.10      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) =       3.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.10
  AVERAGE FLOW DEPTH(FEET) =   0.57   TRAVEL TIME(MIN.) =   1.17
  Tc(MIN.) =   12.54
  SUBAREA AREA(ACRES) =     6.40       SUBAREA RUNOFF(CFS) =    2.01
  EFFECTIVE AREA(ACRES) =     14.70     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       14.7          PEAK FLOW RATE(CFS) =       4.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.60   FLOW VELOCITY(FEET/SEC.) =   4.27
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31105.00 =    1264.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31105.00 TO NODE  31106.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

HZ-31104

```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    585.00  DOWNSTREAM(FEET) =    560.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   344.00   CHANNEL SLOPE =  0.0727
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   2 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               -        0.60      0.60     1.000     -
  USER-DEFINED               -        2.80      0.60     1.000     -
  USER-DEFINED               -        0.60      0.60     1.000     -
  USER-DEFINED               -        0.10      0.60     1.000     -
  USER-DEFINED               -        2.60      0.60     1.000     -
  USER-DEFINED               -        4.10      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.) =   4.61
  AVERAGE FLOW DEPTH(FEET) =   0.66   TRAVEL TIME(MIN.) =   1.24
  Tc(MIN.) =   13.79
  SUBAREA AREA(ACRES) =    10.80       SUBAREA RUNOFF(CFS) =    2.85
  EFFECTIVE AREA(ACRES) =     25.50     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       25.5          PEAK FLOW RATE(CFS) =       6.74

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.69   FLOW VELOCITY(FEET/SEC.) =   4.72
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31106.00 =    1608.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31106.00 TO NODE  31107.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    560.00  DOWNSTREAM(FEET) =    530.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   619.00   CHANNEL SLOPE =  0.0485
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   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               -        0.80      0.60     1.000     -
  USER-DEFINED               -        1.90      0.60     1.000     -
  USER-DEFINED               -        1.50      0.60     1.000     -
  USER-DEFINED               -        8.20      0.60     1.000     -
  USER-DEFINED               -        2.70      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) =       8.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.28
  AVERAGE FLOW DEPTH(FEET) =   0.80   TRAVEL TIME(MIN.) =   2.41
  Tc(MIN.) =   16.20
  SUBAREA AREA(ACRES) =    15.10       SUBAREA RUNOFF(CFS) =    2.87
  EFFECTIVE AREA(ACRES) =     40.60     AREA-AVERAGED Fm(INCH/HR) =   0.60
```

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HZ-31106


```
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.6          PEAK FLOW RATE(CFS) =       7.72

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.78   FLOW VELOCITY(FEET/SEC.) =   4.22
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31107.00 =    2227.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31107.00 TO NODE  31108.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    530.00  DOWNSTREAM(FEET) =    515.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   377.00   CHANNEL SLOPE =  0.0398
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   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               -        0.50      0.60     1.000     -
  USER-DEFINED               -        6.50      0.60     1.000     -
  USER-DEFINED               -        1.30      0.60     1.000     -
  USER-DEFINED               -        1.10      0.60     1.000     -
  USER-DEFINED               -        5.50      0.60     1.000     -
  USER-DEFINED               -        3.40      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) =       9.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.08
  AVERAGE FLOW DEPTH(FEET) =   0.86   TRAVEL TIME(MIN.) =   1.54
  Tc(MIN.) =   17.74
  SUBAREA AREA(ACRES) =    18.30       SUBAREA RUNOFF(CFS) =    2.87
  EFFECTIVE AREA(ACRES) =     58.90     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       58.9          PEAK FLOW RATE(CFS) =       9.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.87   FLOW VELOCITY(FEET/SEC.) =   4.10
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31108.00 =    2604.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31108.00 TO NODE  31109.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    515.00  DOWNSTREAM(FEET) =    490.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   520.00   CHANNEL SLOPE =  0.0481
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   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               -        0.70      0.60     1.000     -
  USER-DEFINED               -        2.20      0.60     1.000     -
```

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HZ-31108

```
  USER-DEFINED               -        3.10      0.60     1.000     -
  USER-DEFINED               -        0.90      0.60     1.000     -
  USER-DEFINED               -        7.40      0.60     1.000     -
  USER-DEFINED               -        0.30      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) =      10.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.50
  AVERAGE FLOW DEPTH(FEET) =   0.86   TRAVEL TIME(MIN.) =   1.93
  Tc(MIN.) =   19.67
  SUBAREA AREA(ACRES) =    14.60       SUBAREA RUNOFF(CFS) =    1.68
  EFFECTIVE AREA(ACRES) =     73.50     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       73.5         PEAK FLOW RATE(CFS) =       9.25
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.84   FLOW VELOCITY(FEET/SEC.) =   4.41
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31109.00 =    3124.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31109.00 TO NODE  31109.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   19.67
  *   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               -       11.40      0.60     1.000     -
  USER-DEFINED               -        8.90      0.60     1.000     -
  USER-DEFINED               -        1.90      0.60     1.000     -
  USER-DEFINED               -        9.20      0.60     1.000     -
  USER-DEFINED               -        1.40      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) =   32.80      SUBAREA RUNOFF(CFS) =    3.78
  EFFECTIVE AREA(ACRES) =    106.30   AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =      106.3       PEAK FLOW RATE(CFS) =      12.26

****************************************************************************
  FLOW PROCESS FROM NODE  31109.00 TO NODE  31110.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    490.00  DOWNSTREAM(FEET) =    432.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1420.00   CHANNEL SLOPE =  0.0408
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.630
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        0.80      0.60     1.000     -
  USER-DEFINED               -        0.60      0.60     1.000     -
```

HZ-31108

HZ-31109


```
  USER-DEFINED               -        0.10      0.60     0.900     -
  USER-DEFINED               -        1.30      0.60     1.000     -
  USER-DEFINED               -        4.00      0.60     1.000     -
  USER-DEFINED               -        1.50      0.60     1.000     -
  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) =      12.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.44
  AVERAGE FLOW DEPTH(FEET) =   0.96   TRAVEL TIME(MIN.) =   5.33
  Tc(MIN.) =   25.00
  SUBAREA AREA(ACRES) =     8.30       SUBAREA RUNOFF(CFS) =    0.23
  EFFECTIVE AREA(ACRES) =    114.60     AREA-AVERAGED Fm(INCH/HR) =   0.60
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      114.6         PEAK FLOW RATE(CFS) =      12.26
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.96   FLOW VELOCITY(FEET/SEC.) =   4.45
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31110.00 =    4544.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31110.00 TO NODE  31110.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   25.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.630
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        0.30      0.60     1.000     -
  USER-DEFINED               -        9.60      0.60     1.000     -
  USER-DEFINED               -        0.40      0.60     0.900     -
  USER-DEFINED               -        6.20      0.60     1.000     -
  USER-DEFINED               -        3.90      0.60     1.000     -
  USER-DEFINED               -        1.40      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.998
  SUBAREA AREA(ACRES) =   21.80      SUBAREA RUNOFF(CFS) =    0.61
  EFFECTIVE AREA(ACRES) =    136.40   AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =      136.4       PEAK FLOW RATE(CFS) =      12.26
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  31110.00 TO NODE  13301.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    432.00  DOWNSTREAM(FEET) =    382.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1847.00   CHANNEL SLOPE =  0.0271
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   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
```

HZ-31110

```
  USER-DEFINED               -        4.90      0.60     1.000     -
  USER-DEFINED               -        1.50      0.60     1.000     -
  USER-DEFINED               -        0.60      0.60     0.900     -
  USER-DEFINED               -        2.50      0.60     1.000     -
  USER-DEFINED               -        5.30      0.60     1.000     -
  USER-DEFINED               -        3.30      0.60     1.000     -
  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) =      12.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.82
  AVERAGE FLOW DEPTH(FEET) =   1.03   TRAVEL TIME(MIN.) =   8.05
  Tc(MIN.) =   33.05
  SUBAREA AREA(ACRES) =    18.10       SUBAREA RUNOFF(CFS) =    0.03
  EFFECTIVE AREA(ACRES) =    154.50     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) =      154.5         PEAK FLOW RATE(CFS) =      12.26
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.03   FLOW VELOCITY(FEET/SEC.) =   3.82
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  13301.00 =    6391.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 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       12.26   33.05    0.536  0.60( 0.60) 1.00     154.5   31100.00
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  13301.00 =    6391.00 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      241.09   57.65    0.379  0.60( 0.49) 0.81    3575.7   13100.00
      2      242.59   59.07    0.371  0.60( 0.49) 0.81    3654.2   13200.00
      3      240.98   65.62    0.354  0.60( 0.49) 0.81    3916.2   13210.00
      4      248.47   97.42    0.287  0.60( 0.49) 0.81    5011.0   13000.00
      5      245.29  100.77    0.281  0.60( 0.49) 0.81    5031.0   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13301.00 =   34659.82 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      207.75   33.05    0.536  0.60( 0.49) 0.82    2204.5   31100.00
      2      249.76   57.65    0.379  0.60( 0.49) 0.82    3730.2   13100.00
      3      251.08   59.07    0.371  0.60( 0.49) 0.82    3808.7   13200.00
      4      249.08   65.62    0.354  0.60( 0.49) 0.82    4070.7   13210.00
      5      255.03   97.42    0.287  0.60( 0.49) 0.82    5165.5   13000.00
      6      251.71  100.77    0.281  0.60( 0.49) 0.82    5185.5   13010.00
    TOTAL AREA(ACRES) =      5185.5
```



```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      255.03  Tc(MIN.) =   97.418
  EFFECTIVE AREA(ACRES) =   5165.55  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     5185.5
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13301.00 =   34659.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  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) =  0.279
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        9.40      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) =     255.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.66
  AVERAGE FLOW DEPTH(FEET) =   4.27   TRAVEL TIME(MIN.) =   4.08
  Tc(MIN.) =  101.50
  SUBAREA AREA(ACRES) =     9.40       SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   5174.95     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) =     5194.9         PEAK FLOW RATE(CFS) =     255.03
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.27   FLOW VELOCITY(FEET/SEC.) =   4.66
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13302.00 =   35800.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13302.00 TO NODE  13302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =  101.50
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.279
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

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HZ-31112

LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	13.80	0.60	1.000	-
USER-DEFINED	-	2.60	0.60	1.000	-
USER-DEFINED	-	1.10	0.60	0.100	-
USER-DEFINED	-	3.50	0.60	0.900	-
USER-DEFINED	-	6.90	0.60	1.000	-
USER-DEFINED	-	0.20	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.952
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
SUBAREA AREA(ACRES) = 28.10 SUBAREA RUNOFF(CFS) = 0.34
EFFECTIVE AREA(ACRES) = 5203.05 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) = 5223.0 PEAK FLOW RATE(CFS) = 255.03
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13302.00 TO NODE 13302.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 101.50
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.279

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SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	0.10	0.60	1.000	-
USER-DEFINED	-	0.10	0.60	0.100	-
USER-DEFINED	-	2.40	0.60	0.900	-
USER-DEFINED	-	0.50	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.894
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
SUBAREA AREA(ACRES) = 3.10 SUBAREA RUNOFF(CFS) = 0.08
EFFECTIVE AREA(ACRES) = 5206.15 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) = 5226.1 PEAK FLOW RATE(CFS) = 255.03
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13302.00 TO NODE 13302.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 101.50
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.279

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SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	0.10	0.60	1.000	-
USER-DEFINED	-	2.60	0.60	1.000	-
USER-DEFINED	-	3.10	0.60	1.000	-

USER-DEFINED	-	0.40	0.60	1.000	-
USER-DEFINED	-	0.20	0.60	1.000	-
USER-DEFINED	-	13.80	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.
SUBAREA AREA(ACRES) = 20.20 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 5226.35 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) = 5246.3 PEAK FLOW RATE(CFS) = 255.03
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13302.00 TO NODE 13302.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 101.50
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.279

HZ-206

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	34.60	0.60	1.000	-
USER-DEFINED	-	2.40	0.60	1.000	-
USER-DEFINED	-	22.60	0.60	1.000	-
USER-DEFINED	-	11.60	0.60	1.000	-
USER-DEFINED	-	0.40	0.60	0.200	-
USER-DEFINED	-	4.80	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.996
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
SUBAREA AREA(ACRES) = 76.40 SUBAREA RUNOFF(CFS) = 0.08
EFFECTIVE AREA(ACRES) = 5302.75 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) = 5322.7 PEAK FLOW RATE(CFS) = 255.03
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13302.00 TO NODE 13302.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 101.50
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.279

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SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	1.60	0.60	1.000	-
USER-DEFINED	-	46.40	0.60	1.000	-
USER-DEFINED	-	0.10	0.60	0.200	-
USER-DEFINED	-	60.70	0.60	1.000	-
USER-DEFINED	-	5.80	0.60	1.000	-

```
  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.
  SUBAREA AREA(ACRES) =  114.60      SUBAREA RUNOFF(CFS) =    0.02
  EFFECTIVE AREA(ACRES) =   5417.35   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) =     5437.3       PEAK FLOW RATE(CFS) =     255.03
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  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) =     255.03
  FLOW VELOCITY(FEET/SEC.) =   5.41   FLOW DEPTH(FEET) =   3.96
  TRAVEL TIME(MIN.) =   6.76   Tc(MIN.) =  108.26
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13303.00 =   37994.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =  108.26
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.267
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        0.20      0.60     1.000     -
  USER-DEFINED                -        0.40      0.60     1.000     -
  USER-DEFINED                -        0.80      0.60     1.000     -
  USER-DEFINED                -        1.40      0.60     0.100     -
  USER-DEFINED                -        2.60      0.60     1.000     -
  USER-DEFINED                -        2.20      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.834
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  SUBAREA AREA(ACRES) =    7.60      SUBAREA RUNOFF(CFS) =    0.30
  EFFECTIVE AREA(ACRES) =   5424.95   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) =     5444.9       PEAK FLOW RATE(CFS) =     255.03
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
```

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```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =  108.26
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.267
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -        3.10      0.60     1.000     -
  USER-DEFINED                -        3.40      0.60     1.000     -
  USER-DEFINED                -        0.50      0.60     1.000     -
  USER-DEFINED                -        0.20      0.60     1.000     -
  USER-DEFINED                -        3.60      0.60     0.100     -
  USER-DEFINED                -        4.00      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.781
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  SUBAREA AREA(ACRES) =   14.80      SUBAREA RUNOFF(CFS) =    0.78
  EFFECTIVE AREA(ACRES) =   5439.75   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) =     5459.7       PEAK FLOW RATE(CFS) =     255.03
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =  108.26
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.267
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED                -       14.60      0.60     1.000     -
  USER-DEFINED                -        6.30      0.60     1.000     -
  USER-DEFINED                -        3.70      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.
  SUBAREA AREA(ACRES) =   24.60      SUBAREA RUNOFF(CFS) =    0.00
  EFFECTIVE AREA(ACRES) =   5464.35   AREA-AVERAGED Fm(INCH/HR) =  0.49
  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) =     5484.3       PEAK FLOW RATE(CFS) =     255.03
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =  108.26
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.267
  SUBAREA LOSS RATE DATA(AMC  II):
```

HZ-207

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	0.50	0.60	1.000	-
USER-DEFINED	-	0.30	0.60	0.100	-
USER-DEFINED	-	0.20	0.60	1.000	-
USER-DEFINED	-	0.80	0.60	0.900	-
USER-DEFINED	-	1.60	0.60	1.000	-
USER-DEFINED	-	31.90	0.60	1.000	-

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.
SUBAREA AREA(ACRES) = 35.30 SUBAREA RUNOFF(CFS) = 0.08
EFFECTIVE AREA(ACRES) = 5499.65 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) = 5519.6 PEAK FLOW RATE(CFS) = 255.03
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13303.00 TO NODE 13303.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========

HZ-31113

MAINLINE Tc(MIN.) = 108.26
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.267
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	1.70	0.60	0.100	-
USER-DEFINED	-	0.30	0.60	1.000	-
USER-DEFINED	-	2.60	0.60	0.900	-
USER-DEFINED	-	5.50	0.60	1.000	-
USER-DEFINED	-	0.20	0.60	1.000	-
USER-DEFINED	-	0.20	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.830
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
SUBAREA AREA(ACRES) = 10.50 SUBAREA RUNOFF(CFS) = 0.43
EFFECTIVE AREA(ACRES) = 5510.15 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) = 5530.1 PEAK FLOW RATE(CFS) = 255.03
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13303.00 TO NODE 13303.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 108.26
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.267
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN

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USER-DEFINED	-	1.30	0.60	0.900	-
USER-DEFINED	-	0.30	0.60	1.000	-
USER-DEFINED	-	0.20	0.60	0.100	-
USER-DEFINED	-	0.30	0.60	1.000	-
USER-DEFINED	-	6.50	0.60	0.900	-
USER-DEFINED	-	3.00	0.60	1.000	-

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.
SUBAREA AREA(ACRES) = 11.60 SUBAREA RUNOFF(CFS) = 0.23
EFFECTIVE AREA(ACRES) = 5521.75 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) = 5541.7 PEAK FLOW RATE(CFS) = 255.03
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13303.00 TO NODE 13304.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

S33-05.5

==========
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) = 0.261
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS 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
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 255.03
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.44
AVERAGE FLOW DEPTH(FEET) = 4.37 TRAVEL TIME(MIN.) = 3.47
Tc(MIN.) = 111.73
SUBAREA AREA(ACRES) = 13.84 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 5535.59 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) = 5555.6 PEAK FLOW RATE(CFS) = 255.03
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 4.37 FLOW VELOCITY(FEET/SEC.) = 4.44
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13304.00 = 38920.27 FEET.

****
FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========

HZ-31114

MAINLINE Tc(MIN.) = 111.73
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.261
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	7.80	0.60	1.000	-
USER-DEFINED	-	1.70	0.60	1.000	-
USER-DEFINED	-	9.40	0.60	1.000	-
USER-DEFINED	-	1.20	0.60	1.000	-
USER-DEFINED	-	0.10	0.60	0.900	-
USER-DEFINED	-	2.60	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.
SUBAREA AREA(ACRES) = 22.80 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 5558.39 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) = 5578.4 PEAK FLOW RATE(CFS) = 255.03
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========

HZ-31114

MAINLINE Tc(MIN.) = 111.73
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.261
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	0.20	0.60	1.000	-
USER-DEFINED	-	0.30	0.60	1.000	-
USER-DEFINED	-	0.20	0.60	0.900	-
USER-DEFINED	-	2.70	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.994
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
SUBAREA AREA(ACRES) = 3.40 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 5561.79 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) = 5581.8 PEAK FLOW RATE(CFS) = 255.03
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
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
S33-05.6
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.246
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	27.40	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) = 255.03
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.95
AVERAGE FLOW DEPTH(FEET) = 3.78 TRAVEL TIME(MIN.) = 8.31
Tc(MIN.) = 120.04
SUBAREA AREA(ACRES) = 27.40 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 5589.19 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) = 5609.2 PEAK FLOW RATE(CFS) = 255.03
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.78 FLOW VELOCITY(FEET/SEC.) = 5.95
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.54 FEET.

****
FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========

MAINLINE Tc(MIN.) = 120.04
HZ-31115
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.246
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.40	0.60	1.000	-
USER-DEFINED	-	1.20	0.60	1.000	-
USER-DEFINED	-	0.10	0.60	1.000	-
USER-DEFINED	-	26.60	0.60	1.000	-
USER-DEFINED	-	3.90	0.60	0.100	-
USER-DEFINED	-	3.00	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.934
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
SUBAREA AREA(ACRES) = 53.20 SUBAREA RUNOFF(CFS) = 0.78
EFFECTIVE AREA(ACRES) = 5642.39 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) = 5662.4 PEAK FLOW RATE(CFS) = 255.03
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

```
 MAINLINE Tc(MIN.) =  120.04
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.246
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -        1.10      0.60      1.000     -
 USER-DEFINED                -        0.20      0.60      1.000     -
 USER-DEFINED                -       14.00      0.60      1.000     -
 USER-DEFINED                -        4.30      0.60      0.100     -
 USER-DEFINED                -        5.30      0.60      1.000     -
 USER-DEFINED                -        2.70      0.60      1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.860
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 SUBAREA AREA(ACRES) =   27.60      SUBAREA RUNOFF(CFS) =    0.86
 EFFECTIVE AREA(ACRES) =   5669.99   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) =     5690.0       PEAK FLOW RATE(CFS) =     255.03
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
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HZ-31115

```
 MAINLINE Tc(MIN.) =  120.04
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.246
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -        3.20      0.60      1.000     -
 USER-DEFINED                -        6.10      0.60      1.000     -
 USER-DEFINED                -        7.50      0.60      0.900     -
 USER-DEFINED                -        5.40      0.60      1.000     -
 USER-DEFINED                -        1.60      0.60      1.000     -
 USER-DEFINED                -        1.90      0.60      1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.971
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 SUBAREA AREA(ACRES) =   25.70      SUBAREA RUNOFF(CFS) =    0.17
 EFFECTIVE AREA(ACRES) =   5695.69   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) =     5715.7       PEAK FLOW RATE(CFS) =     255.03
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =  120.04
```


HZ-31115

```
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.246
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -        2.00      0.60      0.100     -
 USER-DEFINED                -        3.70      0.60      1.000     -
 USER-DEFINED                -        2.10      0.60      1.000     -
 USER-DEFINED                -        2.60      0.60      0.900     -
 USER-DEFINED                -        0.20      0.60      1.000     -
 USER-DEFINED                -        0.10      0.60      1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.807
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 SUBAREA AREA(ACRES) =   10.70      SUBAREA RUNOFF(CFS) =    0.46
 EFFECTIVE AREA(ACRES) =   5706.39   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) =     5726.4       PEAK FLOW RATE(CFS) =     255.03
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
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HZ-31115

```
 MAINLINE Tc(MIN.) =  120.04
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.246
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED                -        0.50      0.60      1.000     -
 USER-DEFINED                -        8.20      0.60      0.900     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.906
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 SUBAREA AREA(ACRES) =    8.70      SUBAREA RUNOFF(CFS) =    0.18
 EFFECTIVE AREA(ACRES) =   5715.09   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) =     5735.1       PEAK FLOW RATE(CFS) =     255.03
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
 PEAK FLOWRATE TABLE FILE NAME: 3A02EV.DNA
 MEMORY BANK #  1 DEFINED AS FOLLOWS:
  STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.)   (INCH/HR)          (ACRES)    NODE
     1      213.95   16.41  0.60( 0.26) 0.43     423.3     120.00
     2      212.87   16.98  0.60( 0.25) 0.42     431.3     110.00
     3      176.90   25.47  0.60( 0.25) 0.42     496.0     100.00
```

```
      4      145.66   35.22  0.60( 0.26) 0.43     510.2     150.00
    TOTAL AREA(ACRES) =      510.2

****************************************************************************
  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       207.75   56.86    0.383  0.60( 0.51) 0.85    2754.1   31100.00
      2       249.76   80.38    0.321  0.60( 0.50) 0.84    4279.8   13100.00
      3       251.08   81.78    0.318  0.60( 0.50) 0.84    4358.3   13200.00
      4       249.08   88.37    0.304  0.60( 0.50) 0.84    4620.2   13210.00
      5       255.03  120.04    0.246  0.60( 0.50) 0.83    5715.1   13000.00
      6       251.71  123.47    0.243  0.60( 0.50) 0.83    5735.1   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.00 =   41886.54 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       213.95   16.41    0.806  0.60( 0.26) 0.43     423.3     120.00
      2       212.87   16.98    0.792  0.60( 0.25) 0.42     431.3     110.00
      3       176.90   25.47    0.623  0.60( 0.25) 0.42     496.0     100.00
      4       145.66   35.22    0.518  0.60( 0.26) 0.43     510.2     150.00
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE  13305.00 =    9867.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       421.70   16.41    0.806  0.60( 0.42) 0.70    1218.2     120.00
      2       420.62   16.98    0.792  0.60( 0.42) 0.71    1253.7     110.00
      3       361.36   25.47    0.623  0.60( 0.44) 0.73    1729.7     100.00
      4       319.80   35.22    0.518  0.60( 0.45) 0.76    2216.2     150.00
      5       315.39   56.86    0.383  0.60( 0.47) 0.79    3264.3   31100.00
      6       340.03   80.38    0.321  0.60( 0.48) 0.79    4790.0   13100.00
      7       340.49   81.78    0.318  0.60( 0.48) 0.79    4868.5   13200.00
      8       334.40   88.37    0.304  0.60( 0.48) 0.80    5130.4   13210.00
      9       324.16  120.04    0.246  0.60( 0.48) 0.80    6225.3   13000.00
     10       319.94  123.47    0.243  0.60( 0.48) 0.80    6245.3   13010.00
    TOTAL AREA(ACRES) =      6245.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      421.70  Tc(MIN.) =   16.412
  EFFECTIVE AREA(ACRES) =   1218.23  AREA-AVERAGED Fm(INCH/HR) =  0.42
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.79
  TOTAL AREA(ACRES) =     6245.3
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.00 =   41886.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

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  FLOW PROCESS FROM NODE  13305.00 TO NODE  13306.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    315.00  DOWNSTREAM(FEET) =    245.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =  4408.41   CHANNEL SLOPE =  0.0158
  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) =  0.614
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       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) =     422.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.53
  AVERAGE FLOW DEPTH(FEET) =   4.32   TRAVEL TIME(MIN.) =   9.76
  Tc(MIN.) =   26.17
  SUBAREA AREA(ACRES) =    68.77       SUBAREA RUNOFF(CFS) =    0.93
  EFFECTIVE AREA(ACRES) =   1287.00     AREA-AVERAGED Fm(INCH/HR) =   0.43
  AREA-AVERAGED Fp(INCH/HR) =   0.60  AREA-AVERAGED Ap =   0.72
  TOTAL AREA(ACRES) =     6314.0         PEAK FLOW RATE(CFS) =     421.70
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.32   FLOW VELOCITY(FEET/SEC.) =   7.53
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13306.00 =   46294.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13306.00 TO NODE  13306.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   26.17
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.614
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       21.50      0.60      1.000     -
  USER-DEFINED               -       15.30      0.60      0.100     -
  USER-DEFINED               -        0.80      0.60      1.000     -
  USER-DEFINED               -        0.60      0.60      1.000     -
  USER-DEFINED               -        8.00      0.60      0.900     -
  USER-DEFINED               -        0.10      0.60      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.685
  SUBAREA AREA(ACRES) =   46.30      SUBAREA RUNOFF(CFS) =    8.44
  EFFECTIVE AREA(ACRES) =   1333.30   AREA-AVERAGED Fm(INCH/HR) =  0.43
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.72
  TOTAL AREA(ACRES) =     6360.3       PEAK FLOW RATE(CFS) =     421.70
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13306.00 TO NODE  13306.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
```

S33-06

HZ-31116

```
==========================================================================
  MAINLINE Tc(MIN.) =   26.17
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.614
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       43.30      0.60     1.000     -
  USER-DEFINED               -        4.90      0.60     0.100     -
  USER-DEFINED               -        5.70      0.60     1.000     -
  USER-DEFINED               -        0.50      0.60     1.000     -
  USER-DEFINED               -        1.10      0.60     0.850     -
  USER-DEFINED               -        3.10      0.60     0.900     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.917
  SUBAREA AREA(ACRES) =   58.60      SUBAREA RUNOFF(CFS) =    3.36
  EFFECTIVE AREA(ACRES) =   1391.90   AREA-AVERAGED Fm(INCH/HR) =  0.44
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.73
  TOTAL AREA(ACRES) =     6418.9       PEAK FLOW RATE(CFS) =     421.70
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

**************************************************************************
  FLOW PROCESS FROM NODE  13306.00 TO NODE  13306.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  MAINLINE Tc(MIN.) =   26.17
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.614
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        6.80      0.60     1.000     -
  USER-DEFINED               -        0.70      0.60     1.000     -
  USER-DEFINED               -        1.10      0.60     0.100     -
  USER-DEFINED               -        0.50      0.60     1.000     -
  USER-DEFINED               -        0.10      0.60     1.000     -
  USER-DEFINED               -        0.50      0.60     0.850     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.890
  SUBAREA AREA(ACRES) =    9.70      SUBAREA RUNOFF(CFS) =    0.70
  EFFECTIVE AREA(ACRES) =   1401.60   AREA-AVERAGED Fm(INCH/HR) =  0.44
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.73
  TOTAL AREA(ACRES) =     6428.6       PEAK FLOW RATE(CFS) =     421.70
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

**************************************************************************
  FLOW PROCESS FROM NODE  13306.00 TO NODE  13306.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  MAINLINE Tc(MIN.) =   26.17
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.614
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        2.20      0.60     0.900     -
  USER-DEFINED               -        0.10      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.904
```

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HZ-31116

HZ-31116


```
  SUBAREA AREA(ACRES) =    2.30      SUBAREA RUNOFF(CFS) =    0.15
  EFFECTIVE AREA(ACRES) =   1403.90   AREA-AVERAGED Fm(INCH/HR) =  0.44
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.73
  TOTAL AREA(ACRES) =     6430.9       PEAK FLOW RATE(CFS) =     421.70
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

**************************************************************************
  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) =    245.00  DOWNSTREAM(FEET) =    220.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1543.21   CHANNEL SLOPE =  0.0162
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  20.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     421.70
  FLOW VELOCITY(FEET/SEC.) =   7.60   FLOW DEPTH(FEET) =   4.30
  TRAVEL TIME(MIN.) =   3.38   Tc(MIN.) =   29.55
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13307.00 =   47838.16 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13307.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  MAINLINE Tc(MIN.) =   29.55
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.566
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        0.20      0.60     0.100     -
  USER-DEFINED               -        0.10      0.60     1.000     -
  USER-DEFINED               -        0.20      0.60     1.000     -
  USER-DEFINED               -        3.70      0.60     1.000     -
  USER-DEFINED               -        0.30      0.60     0.100     -
  USER-DEFINED               -        3.20      0.60     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.942
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  SUBAREA AREA(ACRES) =    7.70      SUBAREA RUNOFF(CFS) =    0.23
  EFFECTIVE AREA(ACRES) =   1411.60   AREA-AVERAGED Fm(INCH/HR) =  0.44
  AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.73
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  TOTAL AREA(ACRES) =     6438.6       PEAK FLOW RATE(CFS) =     421.70
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

**************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13307.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  MAINLINE Tc(MIN.) =   29.55
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.566
  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	-	3.60	0.60	1.000	-
USER-DEFINED	-	1.90	0.60	1.000	-
USER-DEFINED	-	0.60	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.
SUBAREA AREA(ACRES) = 6.10 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 1417.70 AREA-AVERAGED Fm(INCH/HR) = 0.44
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.73
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 6444.7 PEAK FLOW RATE(CFS) = 421.70
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
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) = 421.70
FLOW VELOCITY(FEET/SEC.) = 6.02 FLOW DEPTH(FEET) = 4.83
TRAVEL TIME(MIN.) = 2.56 Tc(MIN.) = 32.12
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.78 FEET.

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 32.12
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.543

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SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	0.10	0.60	1.000	-
USER-DEFINED	-	0.20	0.60	1.000	-
USER-DEFINED	-	5.00	0.60	1.000	-
USER-DEFINED	-	3.20	0.60	0.100	-
USER-DEFINED	-	0.10	0.60	1.000	-
USER-DEFINED	-	0.90	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.697
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
SUBAREA AREA(ACRES) = 9.50 SUBAREA RUNOFF(CFS) = 1.41
EFFECTIVE AREA(ACRES) = 1427.20 AREA-AVERAGED Fm(INCH/HR) = 0.44
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.73
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 6454.2 PEAK FLOW RATE(CFS) = 421.70
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 32.12
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.543

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SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	0.30	0.60	0.200	-
USER-DEFINED	-	0.20	0.60	1.000	-
USER-DEFINED	-	1.00	0.60	1.000	-
USER-DEFINED	-	41.90	0.60	0.100	-
USER-DEFINED	-	7.20	0.60	1.000	-
USER-DEFINED	-	25.00	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.498
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
SUBAREA AREA(ACRES) = 75.60 SUBAREA RUNOFF(CFS) = 18.55
EFFECTIVE AREA(ACRES) = 1502.80 AREA-AVERAGED Fm(INCH/HR) = 0.43
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.72
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 6529.8 PEAK FLOW RATE(CFS) = 421.70
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 32.12
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.543

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SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	0.10	0.60	0.850	-
USER-DEFINED	-	0.90	0.60	1.000	-
USER-DEFINED	-	0.30	0.60	0.600	-
USER-DEFINED	-	13.20	0.60	1.000	-
USER-DEFINED	-	0.50	0.60	0.200	-
USER-DEFINED	-	0.60	0.60	1.000	-

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.
SUBAREA AREA(ACRES) = 15.60 SUBAREA RUNOFF(CFS) = 0.26
EFFECTIVE AREA(ACRES) = 1518.40 AREA-AVERAGED Fm(INCH/HR) = 0.43
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.72
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 6545.4 PEAK FLOW RATE(CFS) = 421.70
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****

```
 FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   32.12
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.543
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -       33.90      0.60     0.100     -
 USER-DEFINED               -       17.60      0.60     1.000     -
 USER-DEFINED               -       16.80      0.60     1.000     -
 USER-DEFINED               -        0.60      0.60     0.200     -
 USER-DEFINED               -        1.50      0.60     0.400     -
 USER-DEFINED               -       10.00      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.603
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 SUBAREA AREA(ACRES) =   80.40      SUBAREA RUNOFF(CFS) =   15.59
 EFFECTIVE AREA(ACRES) =   1598.80   AREA-AVERAGED Fm(INCH/HR) =  0.43
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.72
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     6625.8       PEAK FLOW RATE(CFS) =     421.70
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   32.12
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.543
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -        0.30      0.60     0.600     -
 USER-DEFINED               -        0.70      0.60     1.000     -
 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.
 SUBAREA AREA(ACRES) =    1.00      SUBAREA RUNOFF(CFS) =    0.06
 EFFECTIVE AREA(ACRES) =   1599.80   AREA-AVERAGED Fm(INCH/HR) =  0.43
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.72
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     6626.8       PEAK FLOW RATE(CFS) =     421.70
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   32.12
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.543
```

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HZ-31010.2

```
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -        0.30      0.60     1.000     -
 USER-DEFINED               -        0.80      0.60     1.000     -
 USER-DEFINED               -        0.50      0.60     1.000     -
 USER-DEFINED               -        0.20      0.60     1.000     -
 USER-DEFINED               -        0.30      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.
 SUBAREA AREA(ACRES) =    2.10      SUBAREA RUNOFF(CFS) =    0.00
 EFFECTIVE AREA(ACRES) =   1601.90   AREA-AVERAGED Fm(INCH/HR) =  0.43
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.72
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     6628.9       PEAK FLOW RATE(CFS) =     421.70
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   32.12
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.543
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 USER-DEFINED               -        1.20      0.60     1.000     -
 USER-DEFINED               -        0.50      0.60     1.000     -
 USER-DEFINED               -        1.70      0.60     0.850     -
 USER-DEFINED               -        7.20      0.60     1.000     -
 USER-DEFINED               -        1.00      0.60     1.000     -
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.978
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 SUBAREA AREA(ACRES) =   11.60      SUBAREA RUNOFF(CFS) =    0.12
 EFFECTIVE AREA(ACRES) =   1613.50   AREA-AVERAGED Fm(INCH/HR) =  0.43
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.72
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA(ACRES) =     6640.5       PEAK FLOW RATE(CFS) =     421.70
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     6640.5  TC(MIN.) =     32.12
 EFFECTIVE AREA(ACRES) =   1613.50  AREA-AVERAGED Fm(INCH/HR)=  0.43
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap = 0.718
 PEAK FLOW RATE(CFS)   =     421.70

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      421.70   32.12    0.543  0.60( 0.43) 0.72    1613.5     120.00
     2      420.62   32.68    0.539  0.60( 0.43) 0.72    1649.0     110.00
```

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3	361.36	41.80	0.469	0.60(0.44)	0.73	2125.0	100.00
4	319.80	52.06	0.409	0.60(0.45)	0.76	2611.4	150.00
5	315.39	73.74	0.336	0.60(0.47)	0.78	3659.5	31100.00
6	340.03	96.95	0.287	0.60(0.48)	0.79	5185.2	13100.00
7	340.49	98.35	0.285	0.60(0.48)	0.79	5263.8	13200.00
8	334.40	105.03	0.273	0.60(0.48)	0.79	5525.7	13210.00
9	324.16	136.82	0.230	0.60(0.48)	0.80	6620.6	13000.00
10	319.94	140.31	0.227	0.60(0.48)	0.80	6640.5	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:




 ************************ DESCRIPTION OF STUDY *************************
* GOBERNADORA WATERSHED STUDY - RATIONAL METHOD                        *
* REGIONAL WATERSHED S33- FREE DRAINING - ULTIMATE CONDITION           *
* 5-YR EV AUGUST 2018 ROKAMOTO                                        *
 ***********************************************************************

  FILE NAME: RU05EV33.DAT
  TIME/DATE OF STUDY: 14:21 08/29/2018
==============================================================================
  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;  2.180
   2)   10.00;  1.510
   3)   15.00;  1.200
   4)   20.00;  1.020
   5)   25.00;  0.900
   6)   30.00;  0.830
   7)   40.00;  0.690
   8)   50.00;  0.610
   9)   60.00;  0.550
  10)   90.00;  0.440
  11)  120.00;  0.370
  12)  180.00;  0.310
  13)  360.00;  0.210
  14) 1200.00;  0.090
  *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: S31X05.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      769.71   39.09  0.50( 0.41) 0.81    2485.9   13100.00
      2      520.73   70.06  0.50( 0.40) 0.81    3771.2   13000.00
      3      475.69   73.98  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: S32X05.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      284.60   41.45  0.50( 0.41) 0.83    1124.1   13200.00
      2      281.25   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      284.60   41.45  0.50( 0.41) 0.83    1124.1   13200.00
      2      281.25   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      284.60   41.45    0.678  0.50( 0.41) 0.83    1124.1   13200.00
      2      281.25   41.90    0.675  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       769.71   39.09    0.703  0.50( 0.41) 0.81    2485.9    13100.00
    2       520.73   70.06    0.513  0.50( 0.40) 0.81    3771.2    13000.00
    3       475.69   73.98    0.499  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      1054.32   39.09    0.703  0.50( 0.41) 0.82    3546.1    13100.00
    2      1035.40   41.45    0.678  0.50( 0.41) 0.82    3707.6    13200.00
    3      1028.41   41.90    0.675  0.50( 0.41) 0.82    3729.9    13210.00
    4       627.65   70.06    0.513  0.50( 0.41) 0.81    4898.8    13000.00
    5       568.42   73.98    0.499  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) =     1054.32  Tc(MIN.) =   39.093
EFFECTIVE AREA(ACRES) =   3546.13  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  13222.00 IS CODE =  12
----------------------------------------------------------------------------
>>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
FLOW PROCESS FROM NODE  13222.00 TO NODE  13222.00 IS CODE =  12
----------------------------------------------------------------------------
>>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
FLOW PROCESS FROM NODE  13222.00 TO NODE  13301.00 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    427.51  DOWNSTREAM(FEET) =    382.00
CHANNEL LENGTH THRU SUBAREA(FEET) =  2533.33   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) =  0.663
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED              -        1.40      0.50     0.100     -
USER-DEFINED              -       15.60      0.50     1.000     -
USER-DEFINED              -        0.10      0.50     0.600     -
USER-DEFINED              -        5.30      0.50     1.000     -
USER-DEFINED              -        0.20      0.50     1.000     -
USER-DEFINED              -       22.60      0.50     0.100     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
```

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SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.521
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1062.51
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.96
AVERAGE FLOW DEPTH(FEET) =   5.96   TRAVEL TIME(MIN.) =   4.24
Tc(MIN.) =   43.33
SUBAREA AREA(ACRES) =    45.20       SUBAREA RUNOFF(CFS) =   16.38
EFFECTIVE AREA(ACRES) =   3591.33     AREA-AVERAGED Fm(INCH/HR) =   0.41
AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.81
TOTAL AREA(ACRES) =     4969.6         PEAK FLOW RATE(CFS) =    1054.32
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  5.95   FLOW VELOCITY(FEET/SEC.) =   9.94
LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13301.00 =   34659.82 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
MAINLINE Tc(MIN.) =   43.33
*   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              -        1.00      0.50     1.000     -
USER-DEFINED              -        0.50      0.50     1.000     -
USER-DEFINED              -        7.40      0.50     0.100     -
USER-DEFINED              -        4.70      0.50     1.000     -
USER-DEFINED              -        2.90      0.50     1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.596
SUBAREA AREA(ACRES) =   16.50      SUBAREA RUNOFF(CFS) =    5.42
EFFECTIVE AREA(ACRES) =   3607.83   AREA-AVERAGED Fm(INCH/HR) =  0.41
AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.81
TOTAL AREA(ACRES) =     4986.1       PEAK FLOW RATE(CFS) =    1054.32
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
MAINLINE Tc(MIN.) =   43.33
*   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              -        1.30      0.50     1.000     -
USER-DEFINED              -        0.20      0.50     0.100     -
USER-DEFINED              -        5.30      0.50     1.000     -
USER-DEFINED              -        0.30      0.50     1.000     -
USER-DEFINED              -        0.20      0.50     1.000     -
USER-DEFINED              -        0.60      0.50     1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.977
SUBAREA AREA(ACRES) =    7.90      SUBAREA RUNOFF(CFS) =    1.24
EFFECTIVE AREA(ACRES) =   3615.73   AREA-AVERAGED Fm(INCH/HR) =  0.41
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  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =     4994.0       PEAK FLOW RATE(CFS) =    1054.32
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   43.33
  *   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               -        4.30      0.50     1.000     -
  USER-DEFINED               -        0.80      0.50     1.000     -
  USER-DEFINED               -        1.10      0.50     1.000     -
  USER-DEFINED               -        6.90      0.50     1.000     -
  USER-DEFINED               -        7.90      0.50     1.000     -
  USER-DEFINED               -        1.00      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) =   22.00      SUBAREA RUNOFF(CFS) =    3.23
  EFFECTIVE AREA(ACRES) =   3637.73   AREA-AVERAGED Fm(INCH/HR) =  0.41
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =     5016.0       PEAK FLOW RATE(CFS) =    1054.32
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   43.33
  *   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               -        0.40      0.50     1.000     -
  USER-DEFINED               -       14.60      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) =   15.00      SUBAREA RUNOFF(CFS) =    2.20
  EFFECTIVE AREA(ACRES) =   3652.73   AREA-AVERAGED Fm(INCH/HR) =  0.41
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =     5031.0       PEAK FLOW RATE(CFS) =    1054.32
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  31100.00 TO NODE  31101.00 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) =   317.00
  ELEVATION DATA: UPSTREAM(FEET) =    801.00  DOWNSTREAM(FEET) =    685.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.641
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.692
  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"      -        0.50      0.50     1.000     0    8.64
  NATURAL FAIR COVER
  "OPEN BRUSH"               -        0.30      0.50     1.000     0    8.64
  NATURAL FAIR COVER
  "OPEN BRUSH"               -        0.30      0.50     1.000     0    8.64
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.18
  TOTAL AREA(ACRES) =      1.10   PEAK FLOW RATE(CFS) =      1.18

****************************************************************************
  FLOW PROCESS FROM NODE  31101.00 TO NODE  31102.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    685.00  DOWNSTREAM(FEET) =    655.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   135.00   CHANNEL SLOPE =  0.2222
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.635
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        0.50      0.50     1.000     -
  USER-DEFINED               -        0.10      0.50     1.000     -
  USER-DEFINED               -        0.70      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) =       1.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.30
  AVERAGE FLOW DEPTH(FEET) =   0.34   TRAVEL TIME(MIN.) =   0.42
  Tc(MIN.) =    9.07
  SUBAREA AREA(ACRES) =     1.30       SUBAREA RUNOFF(CFS) =    1.33
  EFFECTIVE AREA(ACRES) =      2.40     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        2.4         PEAK FLOW RATE(CFS) =       2.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.38   FLOW VELOCITY(FEET/SEC.) =   5.53
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31102.00 =     452.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31102.00 TO NODE  31103.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

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```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    655.00  DOWNSTREAM(FEET) =    630.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   203.00   CHANNEL SLOPE =  0.1232
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   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               -        0.30      0.50     1.000     -
  USER-DEFINED               -        0.10      0.50     1.000     -
  USER-DEFINED               -        1.90      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) =       3.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.88
  AVERAGE FLOW DEPTH(FEET) =   0.49   TRAVEL TIME(MIN.) =   0.69
  Tc(MIN.) =    9.76
  SUBAREA AREA(ACRES) =     2.30       SUBAREA RUNOFF(CFS) =    2.16
  EFFECTIVE AREA(ACRES) =      4.70     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        4.7         PEAK FLOW RATE(CFS) =       4.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.53   FLOW VELOCITY(FEET/SEC.) =   5.21
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31103.00 =     655.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31103.00 TO NODE  31104.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    630.00  DOWNSTREAM(FEET) =    605.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   321.00   CHANNEL SLOPE =  0.0779
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   5 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               -        1.10      0.50     1.000     -
  USER-DEFINED               -        2.50      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) =       5.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.76
  AVERAGE FLOW DEPTH(FEET) =   0.65   TRAVEL TIME(MIN.) =   1.12
  Tc(MIN.) =   10.88
  SUBAREA AREA(ACRES) =     3.60       SUBAREA RUNOFF(CFS) =    3.09
  EFFECTIVE AREA(ACRES) =      8.30     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        8.3         PEAK FLOW RATE(CFS) =       7.13

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.69   FLOW VELOCITY(FEET/SEC.) =   4.97
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31104.00 =     976.00 FEET.
```

HZ-31102

HZ-31103


```
****************************************************************************
  FLOW PROCESS FROM NODE  31104.00 TO NODE  31105.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    605.00  DOWNSTREAM(FEET) =    585.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   288.00   CHANNEL SLOPE =  0.0694
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   5 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               -        0.70      0.50     1.000     -
  USER-DEFINED               -        0.60      0.50     1.000     -
  USER-DEFINED               -        3.00      0.50     1.000     -
  USER-DEFINED               -        2.10      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) =       9.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.11
  AVERAGE FLOW DEPTH(FEET) =   0.80   TRAVEL TIME(MIN.) =   0.94
  Tc(MIN.) =   11.82
  SUBAREA AREA(ACRES) =     6.40       SUBAREA RUNOFF(CFS) =    5.17
  EFFECTIVE AREA(ACRES) =     14.70     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       14.7         PEAK FLOW RATE(CFS) =      11.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.86   FLOW VELOCITY(FEET/SEC.) =   5.38
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31105.00 =    1264.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31105.00 TO NODE  31106.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    585.00  DOWNSTREAM(FEET) =    560.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   344.00   CHANNEL SLOPE =  0.0727
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   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               -        0.60      0.50     1.000     -
  USER-DEFINED               -        2.80      0.50     1.000     -
  USER-DEFINED               -        0.60      0.50     1.000     -
  USER-DEFINED               -        0.10      0.50     1.000     -
  USER-DEFINED               -        2.60      0.50     1.000     -
  USER-DEFINED               -        4.10      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) =      15.93
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.87
```

HZ-31104

HZ-31105

```
  AVERAGE FLOW DEPTH(FEET) =   0.95   TRAVEL TIME(MIN.) =   0.98
  Tc(MIN.) =   12.80
  SUBAREA AREA(ACRES) =    10.80       SUBAREA RUNOFF(CFS) =    8.13
  EFFECTIVE AREA(ACRES) =     25.50     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       25.5          PEAK FLOW RATE(CFS) =      19.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.02   FLOW VELOCITY(FEET/SEC.) =   6.16
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31106.00 =    1608.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31106.00 TO NODE  31107.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    560.00  DOWNSTREAM(FEET) =    530.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   619.00   CHANNEL SLOPE =  0.0485
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   5 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               -        0.80      0.50      1.000     -
  USER-DEFINED               -        1.90      0.50      1.000     -
  USER-DEFINED               -        1.50      0.50      1.000     -
  USER-DEFINED               -        8.20      0.50      1.000     -
  USER-DEFINED               -        2.70      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) =      24.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.63
  AVERAGE FLOW DEPTH(FEET) =   1.19   TRAVEL TIME(MIN.) =   1.83
  Tc(MIN.) =   14.63
  SUBAREA AREA(ACRES) =    15.10       SUBAREA RUNOFF(CFS) =    9.82
  EFFECTIVE AREA(ACRES) =     40.60     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.6          PEAK FLOW RATE(CFS) =      26.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.24   FLOW VELOCITY(FEET/SEC.) =   5.74
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31107.00 =    2227.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31107.00 TO NODE  31108.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    530.00  DOWNSTREAM(FEET) =    515.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   377.00   CHANNEL SLOPE =  0.0398
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.173
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
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HZ-31106

HZ-31107

```
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        0.50      0.50      1.000     -
  USER-DEFINED               -        6.50      0.50      1.000     -
  USER-DEFINED               -        1.30      0.50      1.000     -
  USER-DEFINED               -        1.10      0.50      1.000     -
  USER-DEFINED               -        5.50      0.50      1.000     -
  USER-DEFINED               -        3.40      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) =      31.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.61
  AVERAGE FLOW DEPTH(FEET) =   1.38   TRAVEL TIME(MIN.) =   1.12
  Tc(MIN.) =   15.75
  SUBAREA AREA(ACRES) =    18.30       SUBAREA RUNOFF(CFS) =   11.08
  EFFECTIVE AREA(ACRES) =     58.90     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       58.9          PEAK FLOW RATE(CFS) =      35.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.44   FLOW VELOCITY(FEET/SEC.) =   5.74
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31108.00 =    2604.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31108.00 TO NODE  31109.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    515.00  DOWNSTREAM(FEET) =    490.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   520.00   CHANNEL SLOPE =  0.0481
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.124
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        0.70      0.50      1.000     -
  USER-DEFINED               -        2.20      0.50      1.000     -
  USER-DEFINED               -        3.10      0.50      1.000     -
  USER-DEFINED               -        0.90      0.50      1.000     -
  USER-DEFINED               -        7.40      0.50      1.000     -
  USER-DEFINED               -        0.30      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) =      39.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.33
  AVERAGE FLOW DEPTH(FEET) =   1.45   TRAVEL TIME(MIN.) =   1.37
  Tc(MIN.) =   17.12
  SUBAREA AREA(ACRES) =    14.60       SUBAREA RUNOFF(CFS) =    8.19
  EFFECTIVE AREA(ACRES) =     73.50     AREA-AVERAGED Fm(INCH/HR) =   0.50
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       73.5          PEAK FLOW RATE(CFS) =      41.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.47   FLOW VELOCITY(FEET/SEC.) =   6.38
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31109.00 =    3124.00 FEET.

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HZ-31108

FLOW PROCESS FROM NODE 31109.00 TO NODE 31109.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN.) = 17.12
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.124

HZ-31108

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	11.40	0.50	1.000	-
USER-DEFINED	-	8.90	0.50	1.000	-
USER-DEFINED	-	1.90	0.50	1.000	-
USER-DEFINED	-	9.20	0.50	1.000	-
USER-DEFINED	-	1.40	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) = 32.80 SUBAREA RUNOFF(CFS) = 18.41
EFFECTIVE AREA(ACRES) = 106.30 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 106.3 PEAK FLOW RATE(CFS) = 59.65

FLOW PROCESS FROM NODE 31109.00 TO NODE 31110.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 490.00 DOWNSTREAM(FEET) = 432.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1420.00 CHANNEL SLOPE = 0.0408
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.004

HZ-31109

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	0.80	0.50	1.000	-
USER-DEFINED	-	0.60	0.50	1.000	-
USER-DEFINED	-	0.10	0.50	0.900	-
USER-DEFINED	-	1.30	0.50	1.000	-
USER-DEFINED	-	4.00	0.50	1.000	-
USER-DEFINED	-	1.50	0.50	1.000	-

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) = 61.54
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.64
AVERAGE FLOW DEPTH(FEET) = 1.76 TRAVEL TIME(MIN.) = 3.56
Tc(MIN.) = 20.68
SUBAREA AREA(ACRES) = 8.30 SUBAREA RUNOFF(CFS) = 3.76
EFFECTIVE AREA(ACRES) = 114.60 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 114.6 PEAK FLOW RATE(CFS) = 59.65
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.74 FLOW VELOCITY(FEET/SEC.) = 6.59
LONGEST FLOWPATH FROM NODE 31100.00 TO NODE 31110.00 = 4544.00 FEET.

FLOW PROCESS FROM NODE 31110.00 TO NODE 31110.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN.) = 20.68
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.004

HZ-31109

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	0.30	0.50	1.000	-
USER-DEFINED	-	9.60	0.50	1.000	-
USER-DEFINED	-	0.40	0.50	0.900	-
USER-DEFINED	-	6.20	0.50	1.000	-
USER-DEFINED	-	3.90	0.50	1.000	-
USER-DEFINED	-	1.40	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.998
SUBAREA AREA(ACRES) = 21.80 SUBAREA RUNOFF(CFS) = 9.89
EFFECTIVE AREA(ACRES) = 136.40 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 136.4 PEAK FLOW RATE(CFS) = 61.82

FLOW PROCESS FROM NODE 31110.00 TO NODE 13301.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 432.00 DOWNSTREAM(FEET) = 382.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1847.00 CHANNEL SLOPE = 0.0271
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.886

HZ-31110

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	4.90	0.50	1.000	-
USER-DEFINED	-	1.50	0.50	1.000	-
USER-DEFINED	-	0.60	0.50	0.900	-
USER-DEFINED	-	2.50	0.50	1.000	-
USER-DEFINED	-	5.30	0.50	1.000	-
USER-DEFINED	-	3.30	0.50	1.000	-

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) = 64.97
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.78
AVERAGE FLOW DEPTH(FEET) = 1.94 TRAVEL TIME(MIN.) = 5.32
Tc(MIN.) = 26.01
SUBAREA AREA(ACRES) = 18.10 SUBAREA RUNOFF(CFS) = 6.31
EFFECTIVE AREA(ACRES) = 154.50 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 154.5 PEAK FLOW RATE(CFS) = 61.82
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.90 FLOW VELOCITY(FEET/SEC.) = 5.69
LONGEST FLOWPATH FROM NODE 31100.00 TO NODE 13301.00 = 6391.00 FEET.

```
****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 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       61.82   26.01    0.886  0.50( 0.50) 1.00     154.5   31100.00
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  13301.00 =    6391.00 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     1054.32   43.33    0.663  0.50( 0.41) 0.81    3652.7   13100.00
      2     1035.40   45.71    0.644  0.50( 0.41) 0.81    3814.2   13200.00
      3     1028.41   46.16    0.641  0.50( 0.41) 0.81    3836.5   13210.00
      4      627.65   74.88    0.495  0.50( 0.41) 0.81    5005.4   13000.00
      5      568.42   78.94    0.481  0.50( 0.41) 0.81    5031.0   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13301.00 =   34659.82 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     1116.14   26.01    0.886  0.50( 0.41) 0.82    2346.6   31100.00
      2     1080.50   43.33    0.663  0.50( 0.41) 0.82    3807.2   13100.00
      3     1058.54   45.71    0.644  0.50( 0.41) 0.82    3968.7   13200.00
      4     1050.96   46.16    0.641  0.50( 0.41) 0.82    3991.0   13210.00
      5      627.71   74.88    0.495  0.50( 0.41) 0.82    5159.9   13000.00
      6      568.47   78.94    0.481  0.50( 0.41) 0.82    5185.5   13010.00
    TOTAL AREA(ACRES) =      5185.5

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1116.14  Tc(MIN.) =   26.005
  EFFECTIVE AREA(ACRES) =   2346.62  AREA-AVERAGED Fm(INCH/HR) =  0.41
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     5185.5
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13301.00 =   34659.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  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) =  0.846
  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              -        9.40      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) =    1117.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.74
  AVERAGE FLOW DEPTH(FEET) =   7.43   TRAVEL TIME(MIN.) =   2.82
  Tc(MIN.) =   28.83
  SUBAREA AREA(ACRES) =     9.40       SUBAREA RUNOFF(CFS) =    2.93
  EFFECTIVE AREA(ACRES) =   2356.02     AREA-AVERAGED Fm(INCH/HR) =   0.41
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.83
  TOTAL AREA(ACRES) =     5194.9         PEAK FLOW RATE(CFS) =    1116.14
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.43   FLOW VELOCITY(FEET/SEC.) =   6.74
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13302.00 =   35800.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13302.00 TO NODE  13302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   28.83
  *   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              -       13.80      0.50      1.000     -
  USER-DEFINED              -        2.60      0.50      1.000     -
  USER-DEFINED              -        1.10      0.50      0.100     -
  USER-DEFINED              -        3.50      0.50      0.900     -
  USER-DEFINED              -        6.90      0.50      1.000     -
  USER-DEFINED              -        0.20      0.50      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.952
  SUBAREA AREA(ACRES) =   28.10      SUBAREA RUNOFF(CFS) =    9.36
  EFFECTIVE AREA(ACRES) =   2384.12   AREA-AVERAGED Fm(INCH/HR) =  0.41
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5223.0       PEAK FLOW RATE(CFS) =    1116.14
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13302.00 TO NODE  13302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   28.83
  *   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              -        0.10      0.50      1.000     -
  USER-DEFINED              -        0.10      0.50      0.100     -
  USER-DEFINED              -        2.40      0.50      0.900     -
  USER-DEFINED              -        0.50      0.50      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
```

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HZ-31112

HZ-31112

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.894
SUBAREA AREA(ACRES) = 3.10 SUBAREA RUNOFF(CFS) = 1.11
EFFECTIVE AREA(ACRES) = 2387.22 AREA-AVERAGED Fm(INCH/HR) = 0.41
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.83
TOTAL AREA(ACRES) = 5226.1 PEAK FLOW RATE(CFS) = 1116.14
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13302.00 TO NODE 13302.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 28.83
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.846
SUBAREA LOSS RATE DATA(AMC II):

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DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	0.10	0.50	1.000	-
USER-DEFINED	-	2.60	0.50	1.000	-
USER-DEFINED	-	3.10	0.50	1.000	-
USER-DEFINED	-	0.40	0.50	1.000	-
USER-DEFINED	-	0.20	0.50	1.000	-
USER-DEFINED	-	13.80	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) = 20.20 SUBAREA RUNOFF(CFS) = 6.29
EFFECTIVE AREA(ACRES) = 2407.42 AREA-AVERAGED Fm(INCH/HR) = 0.41
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.83
TOTAL AREA(ACRES) = 5246.3 PEAK FLOW RATE(CFS) = 1116.14
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13302.00 TO NODE 13302.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 28.83
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.846
SUBAREA LOSS RATE DATA(AMC II):

HZ-206

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	34.60	0.50	1.000	-
USER-DEFINED	-	2.40	0.50	1.000	-
USER-DEFINED	-	22.60	0.50	1.000	-
USER-DEFINED	-	11.60	0.50	1.000	-
USER-DEFINED	-	0.40	0.50	0.200	-
USER-DEFINED	-	4.80	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.996
SUBAREA AREA(ACRES) = 76.40 SUBAREA RUNOFF(CFS) = 23.95
EFFECTIVE AREA(ACRES) = 2483.82 AREA-AVERAGED Fm(INCH/HR) = 0.42
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.83
TOTAL AREA(ACRES) = 5322.7 PEAK FLOW RATE(CFS) = 1116.14
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13302.00 TO NODE 13302.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 28.83
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.846
SUBAREA LOSS RATE DATA(AMC II):

HZ-206

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	1.60	0.50	1.000	-
USER-DEFINED	-	46.40	0.50	1.000	-
USER-DEFINED	-	0.10	0.50	0.200	-
USER-DEFINED	-	60.70	0.50	1.000	-
USER-DEFINED	-	5.80	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.999
SUBAREA AREA(ACRES) = 114.60 SUBAREA RUNOFF(CFS) = 35.75
EFFECTIVE AREA(ACRES) = 2598.42 AREA-AVERAGED Fm(INCH/HR) = 0.42
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.84
TOTAL AREA(ACRES) = 5437.3 PEAK FLOW RATE(CFS) = 1116.14
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
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) = 1116.14
FLOW VELOCITY(FEET/SEC.) = 7.81 FLOW DEPTH(FEET) = 6.90
TRAVEL TIME(MIN.) = 4.68 Tc(MIN.) = 33.51
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13303.00 = 37994.87 FEET.

****
FLOW PROCESS FROM NODE 13303.00 TO NODE 13303.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 33.51
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.781
SUBAREA LOSS RATE DATA(AMC II):

HZ-207

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	0.20	0.50	1.000	-
USER-DEFINED	-	0.40	0.50	1.000	-
USER-DEFINED	-	0.80	0.50	1.000	-
USER-DEFINED	-	1.40	0.50	0.100	-
USER-DEFINED	-	2.60	0.50	1.000	-
USER-DEFINED	-	2.20	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.834
SUBAREA AREA(ACRES) = 7.60 SUBAREA RUNOFF(CFS) = 2.49
EFFECTIVE AREA(ACRES) = 2606.02 AREA-AVERAGED Fm(INCH/HR) = 0.42
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.84
TOTAL AREA(ACRES) = 5444.9 PEAK FLOW RATE(CFS) = 1116.14
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

```
****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   33.51
  *   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               -        3.10      0.50     1.000     -
  USER-DEFINED               -        3.40      0.50     1.000     -
  USER-DEFINED               -        0.50      0.50     1.000     -
  USER-DEFINED               -        0.20      0.50     1.000     -
  USER-DEFINED               -        3.60      0.50     0.100     -
  USER-DEFINED               -        4.00      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.781
  SUBAREA AREA(ACRES) =   14.80      SUBAREA RUNOFF(CFS) =    5.20
  EFFECTIVE AREA(ACRES) =   2620.82   AREA-AVERAGED Fm(INCH/HR) =  0.42
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =     5459.7       PEAK FLOW RATE(CFS) =    1116.14
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

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```
****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   33.51
  *   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               -       14.60      0.50     1.000     -
  USER-DEFINED               -        6.30      0.50     1.000     -
  USER-DEFINED               -        3.70      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) =   24.60      SUBAREA RUNOFF(CFS) =    6.22
  EFFECTIVE AREA(ACRES) =   2645.42   AREA-AVERAGED Fm(INCH/HR) =  0.42
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =     5484.3       PEAK FLOW RATE(CFS) =    1116.14
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

HZ-207

```
****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   33.51
  *   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               -        0.50      0.50     1.000     -
  USER-DEFINED               -        0.30      0.50     0.100     -
```

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```
  USER-DEFINED               -        0.20      0.50     1.000     -
  USER-DEFINED               -        0.80      0.50     0.900     -
  USER-DEFINED               -        1.60      0.50     1.000     -
  USER-DEFINED               -       31.90      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.990
  SUBAREA AREA(ACRES) =   35.30      SUBAREA RUNOFF(CFS) =    9.08
  EFFECTIVE AREA(ACRES) =   2680.72   AREA-AVERAGED Fm(INCH/HR) =  0.42
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =     5519.6       PEAK FLOW RATE(CFS) =    1116.14
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   33.51
  *   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               -        1.70      0.50     0.100     -
  USER-DEFINED               -        0.30      0.50     1.000     -
  USER-DEFINED               -        2.60      0.50     0.900     -
  USER-DEFINED               -        5.50      0.50     1.000     -
  USER-DEFINED               -        0.20      0.50     1.000     -
  USER-DEFINED               -        0.20      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.830
  SUBAREA AREA(ACRES) =   10.50      SUBAREA RUNOFF(CFS) =    3.46
  EFFECTIVE AREA(ACRES) =   2691.22   AREA-AVERAGED Fm(INCH/HR) =  0.42
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =     5530.1       PEAK FLOW RATE(CFS) =    1116.14
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

HZ-31113

```
****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   33.51
  *   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               -        1.30      0.50     0.900     -
  USER-DEFINED               -        0.30      0.50     1.000     -
  USER-DEFINED               -        0.20      0.50     0.100     -
  USER-DEFINED               -        0.30      0.50     1.000     -
  USER-DEFINED               -        6.50      0.50     0.900     -
  USER-DEFINED               -        3.00      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.917
  SUBAREA AREA(ACRES) =   11.60      SUBAREA RUNOFF(CFS) =    3.36
  EFFECTIVE AREA(ACRES) =   2702.82   AREA-AVERAGED Fm(INCH/HR) =  0.42
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =     5541.7       PEAK FLOW RATE(CFS) =    1116.14
```

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

****************************************************************************
  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) =  0.747
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       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) =    1117.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.43
  AVERAGE FLOW DEPTH(FEET) =   7.61   TRAVEL TIME(MIN.) =   2.40
  Tc(MIN.) =   35.90
  SUBAREA AREA(ACRES) =    13.84       SUBAREA RUNOFF(CFS) =    3.08
  EFFECTIVE AREA(ACRES) =   2716.66     AREA-AVERAGED Fm(INCH/HR) =   0.42
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.85
  TOTAL AREA(ACRES) =     5555.6         PEAK FLOW RATE(CFS) =    1116.14
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.61   FLOW VELOCITY(FEET/SEC.) =   6.43
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13304.00 =   38920.27 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13304.00 TO NODE  13304.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   35.90
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.747
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        7.80      0.50     1.000     -
  USER-DEFINED               -        1.70      0.50     1.000     -
  USER-DEFINED               -        9.40      0.50     1.000     -
  USER-DEFINED               -        1.20      0.50     1.000     -
  USER-DEFINED               -        0.10      0.50     0.900     -
  USER-DEFINED               -        2.60      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) =   22.80      SUBAREA RUNOFF(CFS) =    5.08
  EFFECTIVE AREA(ACRES) =   2739.46   AREA-AVERAGED Fm(INCH/HR) =  0.42
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.85
  TOTAL AREA(ACRES) =     5578.4       PEAK FLOW RATE(CFS) =    1116.14
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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

S33-05.5

HZ-31114


```
  FLOW PROCESS FROM NODE  13304.00 TO NODE  13304.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   35.90
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.747
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -        0.20      0.50     1.000     -
  USER-DEFINED               -        0.30      0.50     1.000     -
  USER-DEFINED               -        0.20      0.50     0.900     -
  USER-DEFINED               -        2.70      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.994
  SUBAREA AREA(ACRES) =    3.40      SUBAREA RUNOFF(CFS) =    0.77
  EFFECTIVE AREA(ACRES) =   2742.86   AREA-AVERAGED Fm(INCH/HR) =  0.42
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.85
  TOTAL AREA(ACRES) =     5581.8       PEAK FLOW RATE(CFS) =    1116.14
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  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) =  0.677
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       27.40      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) =    1118.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.61
  AVERAGE FLOW DEPTH(FEET) =   6.58   TRAVEL TIME(MIN.) =   5.74
  Tc(MIN.) =   41.64
  SUBAREA AREA(ACRES) =    27.40       SUBAREA RUNOFF(CFS) =    4.36
  EFFECTIVE AREA(ACRES) =   2770.26     AREA-AVERAGED Fm(INCH/HR) =   0.42
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.85
  TOTAL AREA(ACRES) =     5609.2         PEAK FLOW RATE(CFS) =    1116.14
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.57   FLOW VELOCITY(FEET/SEC.) =   8.61
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.00 =   41886.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   41.64
```

S33-05.6

HZ-31115

```
*   5 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                -       18.40      0.50      1.000     -
USER-DEFINED                -        1.20      0.50      1.000     -
USER-DEFINED                -        0.10      0.50      1.000     -
USER-DEFINED                -       26.60      0.50      1.000     -
USER-DEFINED                -        3.90      0.50      0.100     -
USER-DEFINED                -        3.00      0.50      1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.934
SUBAREA AREA(ACRES) =   53.20      SUBAREA RUNOFF(CFS) =   10.04
EFFECTIVE AREA(ACRES) =   2823.46   AREA-AVERAGED Fm(INCH/HR) =  0.43
AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.85
TOTAL AREA(ACRES) =     5662.4       PEAK FLOW RATE(CFS) =    1116.14
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   41.64
```

HZ-31115

```
*   5 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                -        1.10      0.50      1.000     -
USER-DEFINED                -        0.20      0.50      1.000     -
USER-DEFINED                -       14.00      0.50      1.000     -
USER-DEFINED                -        4.30      0.50      0.100     -
USER-DEFINED                -        5.30      0.50      1.000     -
USER-DEFINED                -        2.70      0.50      1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.860
SUBAREA AREA(ACRES) =   27.60      SUBAREA RUNOFF(CFS) =    6.13
EFFECTIVE AREA(ACRES) =   2851.06   AREA-AVERAGED Fm(INCH/HR) =  0.43
AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.85
TOTAL AREA(ACRES) =     5690.0       PEAK FLOW RATE(CFS) =    1116.14
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   41.64
```

HZ-31115

```
*   5 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                -        3.20      0.50      1.000     -
USER-DEFINED                -        6.10      0.50      1.000     -
USER-DEFINED                -        7.50      0.50      0.900     -
USER-DEFINED                -        5.40      0.50      1.000     -
USER-DEFINED                -        1.60      0.50      1.000     -
USER-DEFINED                -        1.90      0.50      1.000     -
```



```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.971
SUBAREA AREA(ACRES) =   25.70      SUBAREA RUNOFF(CFS) =    4.42
EFFECTIVE AREA(ACRES) =   2876.76   AREA-AVERAGED Fm(INCH/HR) =  0.43
AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.85
TOTAL AREA(ACRES) =     5715.7       PEAK FLOW RATE(CFS) =    1116.14
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   41.64
```

HZ-31115

```
*   5 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                -        2.00      0.50      0.100     -
USER-DEFINED                -        3.70      0.50      1.000     -
USER-DEFINED                -        2.10      0.50      1.000     -
USER-DEFINED                -        2.60      0.50      0.900     -
USER-DEFINED                -        0.20      0.50      1.000     -
USER-DEFINED                -        0.10      0.50      1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.807
SUBAREA AREA(ACRES) =   10.70      SUBAREA RUNOFF(CFS) =    2.63
EFFECTIVE AREA(ACRES) =   2887.46   AREA-AVERAGED Fm(INCH/HR) =  0.43
AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.85
TOTAL AREA(ACRES) =     5726.4       PEAK FLOW RATE(CFS) =    1116.14
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   41.64
```

HZ-31115

```
*   5 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                -        0.50      0.50      1.000     -
USER-DEFINED                -        8.20      0.50      0.900     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.906
SUBAREA AREA(ACRES) =    8.70      SUBAREA RUNOFF(CFS) =    1.75
EFFECTIVE AREA(ACRES) =   2896.16   AREA-AVERAGED Fm(INCH/HR) =  0.43
AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.85
TOTAL AREA(ACRES) =     5735.1       PEAK FLOW RATE(CFS) =    1116.14
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 3A05EV.DNA
```

```
 MEMORY BANK #  1 DEFINED AS FOLLOWS:
  STREAM        Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER      (CFS)  (MIN.)  (INCH/HR)           (ACRES)    NODE
     1       387.68   15.30  0.50( 0.22) 0.43      428.3     120.00
     2       384.11   15.76  0.50( 0.21) 0.43      435.3     110.00
     3       331.96   23.64  0.50( 0.21) 0.42      501.4     100.00
     4       298.47   28.52  0.50( 0.22) 0.43      510.2     150.00
    TOTAL AREA(ACRES) =       510.2

****************************************************************************
  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      1116.14   41.64    0.677  0.50( 0.43) 0.85    2896.2   31100.00
     2      1080.50   59.10    0.555  0.50( 0.42) 0.84    4356.8   13100.00
     3      1058.54   61.55    0.544  0.50( 0.42) 0.84    4518.2   13200.00
     4      1050.96   62.04    0.543  0.50( 0.42) 0.84    4540.5   13210.00
     5       627.71   92.94    0.433  0.50( 0.42) 0.83    5709.5   13000.00
     6       568.47   97.45    0.423  0.50( 0.42) 0.83    5735.1   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.00 =   41886.54 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       387.68   15.30    1.189  0.50( 0.22) 0.43      428.3     120.00
     2       384.11   15.76    1.173  0.50( 0.21) 0.43      435.3     110.00
     3       331.96   23.64    0.933  0.50( 0.21) 0.42      501.4     100.00
     4       298.47   28.52    0.851  0.50( 0.22) 0.43      510.2     150.00
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE  13305.00 =    9867.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
     1      1503.81   15.30    1.189  0.50( 0.37) 0.73    1492.1     120.00
     2      1500.25   15.76    1.173  0.50( 0.37) 0.73    1531.2     110.00
     3      1448.09   23.64    0.933  0.50( 0.38) 0.75    2145.3     100.00
     4      1414.60   28.52    0.851  0.50( 0.38) 0.77    2493.7     150.00
     5      1332.73   41.64    0.677  0.50( 0.39) 0.79    3406.4   31100.00
     6      1239.90   59.10    0.555  0.50( 0.40) 0.80    4867.0   13100.00
     7      1212.73   61.55    0.544  0.50( 0.40) 0.80    5028.4   13200.00
     8      1204.30   62.04    0.543  0.50( 0.40) 0.80    5050.7   13210.00
     9       743.24   92.94    0.433  0.50( 0.40) 0.80    6219.7   13000.00
    10       681.19   97.45    0.423  0.50( 0.40) 0.80    6245.3   13010.00
    TOTAL AREA(ACRES) =       6245.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1503.81  Tc(MIN.) =   15.297
  EFFECTIVE AREA(ACRES) =   1492.08  AREA-AVERAGED Fm(INCH/HR) =  0.37
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.80
  TOTAL AREA(ACRES) =     6245.3
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.00 =   41886.54 FEET.

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



```
  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  13306.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    315.00  DOWNSTREAM(FEET) =    245.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =  4408.41   CHANNEL SLOPE =  0.0158
  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) =  0.963
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  USER-DEFINED               -       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) =    1518.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.37
  AVERAGE FLOW DEPTH(FEET) =   6.99   TRAVEL TIME(MIN.) =   7.09
  Tc(MIN.) =   22.38
  SUBAREA AREA(ACRES) =    68.77       SUBAREA RUNOFF(CFS) =   28.70
  EFFECTIVE AREA(ACRES) =   1560.85     AREA-AVERAGED Fm(INCH/HR) =   0.37
  AREA-AVERAGED Fp(INCH/HR) =   0.50  AREA-AVERAGED Ap =   0.74
  TOTAL AREA(ACRES) =     6314.0          PEAK FLOW RATE(CFS) =    1503.81
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.96   FLOW VELOCITY(FEET/SEC.) =  10.35
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13306.00 =   46294.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13306.00 TO NODE  13306.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   22.38
  *   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               -       21.50      0.50      1.000     -
  USER-DEFINED               -       15.30      0.50      0.100     -
  USER-DEFINED               -        0.80      0.50      1.000     -
  USER-DEFINED               -        0.60      0.50      1.000     -
  USER-DEFINED               -        8.00      0.50      0.900     -
  USER-DEFINED               -        0.10      0.50      1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.685
  SUBAREA AREA(ACRES) =   46.30       SUBAREA RUNOFF(CFS) =   25.84
  EFFECTIVE AREA(ACRES) =   1607.15   AREA-AVERAGED Fm(INCH/HR) =  0.37
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.74
  TOTAL AREA(ACRES) =     6360.3        PEAK FLOW RATE(CFS) =    1503.81
```

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13306.00 TO NODE 13306.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 22.38
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.963
SUBAREA LOSS RATE DATA(AMC II):

HZ-31116

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	43.30	0.50	1.000	-
USER-DEFINED	-	4.90	0.50	0.100	-
USER-DEFINED	-	5.70	0.50	1.000	-
USER-DEFINED	-	0.50	0.50	1.000	-
USER-DEFINED	-	1.10	0.50	0.850	-
USER-DEFINED	-	3.10	0.50	0.900	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.917
SUBAREA AREA(ACRES) = 58.60 SUBAREA RUNOFF(CFS) = 26.60
EFFECTIVE AREA(ACRES) = 1665.75 AREA-AVERAGED Fm(INCH/HR) = 0.37
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.75
TOTAL AREA(ACRES) = 6418.9 PEAK FLOW RATE(CFS) = 1503.81
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13306.00 TO NODE 13306.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 22.38
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.963
SUBAREA LOSS RATE DATA(AMC II):

HZ-31116

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	6.80	0.50	1.000	-
USER-DEFINED	-	0.70	0.50	1.000	-
USER-DEFINED	-	1.10	0.50	0.100	-
USER-DEFINED	-	0.50	0.50	1.000	-
USER-DEFINED	-	0.10	0.50	1.000	-
USER-DEFINED	-	0.50	0.50	0.850	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.890
SUBAREA AREA(ACRES) = 9.70 SUBAREA RUNOFF(CFS) = 4.52
EFFECTIVE AREA(ACRES) = 1675.45 AREA-AVERAGED Fm(INCH/HR) = 0.37
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.75
TOTAL AREA(ACRES) = 6428.6 PEAK FLOW RATE(CFS) = 1503.81
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13306.00 TO NODE 13306.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 22.38
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.963
SUBAREA LOSS RATE DATA(AMC II):

HZ-31116

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	2.20	0.50	0.900	-
USER-DEFINED	-	0.10	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.904
SUBAREA AREA(ACRES) = 2.30 SUBAREA RUNOFF(CFS) = 1.06
EFFECTIVE AREA(ACRES) = 1677.75 AREA-AVERAGED Fm(INCH/HR) = 0.37
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.75
TOTAL AREA(ACRES) = 6430.9 PEAK FLOW RATE(CFS) = 1503.81
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
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) = 245.00 DOWNSTREAM(FEET) = 220.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1543.21 CHANNEL SLOPE = 0.0162
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 1503.81
FLOW VELOCITY(FEET/SEC.) = 10.45 FLOW DEPTH(FEET) = 6.92
TRAVEL TIME(MIN.) = 2.46 Tc(MIN.) = 24.84
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13307.00 = 47838.16 FEET.

****
FLOW PROCESS FROM NODE 13307.00 TO NODE 13307.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 24.84
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.904
SUBAREA LOSS RATE DATA(AMC II):

HZ-31010

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	0.20	0.50	0.100	-
USER-DEFINED	-	0.10	0.50	1.000	-
USER-DEFINED	-	0.20	0.50	1.000	-
USER-DEFINED	-	3.70	0.50	1.000	-
USER-DEFINED	-	0.30	0.50	0.100	-
USER-DEFINED	-	3.20	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.942
SUBAREA AREA(ACRES) = 7.70 SUBAREA RUNOFF(CFS) = 3.00
EFFECTIVE AREA(ACRES) = 1685.45 AREA-AVERAGED Fm(INCH/HR) = 0.37
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.75
TOTAL AREA(ACRES) = 6438.6 PEAK FLOW RATE(CFS) = 1503.81
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13307.00 TO NODE 13307.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 24.84
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.904

HZ-31010

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	3.60	0.50	1.000	-
USER-DEFINED	-	1.90	0.50	1.000	-
USER-DEFINED	-	0.60	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) = 6.10 SUBAREA RUNOFF(CFS) = 2.22
EFFECTIVE AREA(ACRES) = 1691.55 AREA-AVERAGED Fm(INCH/HR) = 0.37
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.75
TOTAL AREA(ACRES) = 6444.7 PEAK FLOW RATE(CFS) = 1503.81
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
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) = 1503.81
FLOW VELOCITY(FEET/SEC.) = 8.26 FLOW DEPTH(FEET) = 7.79
TRAVEL TIME(MIN.) = 1.87 Tc(MIN.) = 26.71
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.78 FEET.

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 26.71
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.876

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SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	0.10	0.50	1.000	-
USER-DEFINED	-	0.20	0.50	1.000	-
USER-DEFINED	-	5.00	0.50	1.000	-
USER-DEFINED	-	3.20	0.50	0.100	-
USER-DEFINED	-	0.10	0.50	1.000	-
USER-DEFINED	-	0.90	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.697
SUBAREA AREA(ACRES) = 9.50 SUBAREA RUNOFF(CFS) = 4.51
EFFECTIVE AREA(ACRES) = 1701.05 AREA-AVERAGED Fm(INCH/HR) = 0.37
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.75
TOTAL AREA(ACRES) = 6454.2 PEAK FLOW RATE(CFS) = 1503.81
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========

MAINLINE Tc(MIN.) = 26.71
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.876

HZ-208

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	0.30	0.50	0.200	-
USER-DEFINED	-	0.20	0.50	1.000	-
USER-DEFINED	-	1.00	0.50	1.000	-
USER-DEFINED	-	41.90	0.50	0.100	-
USER-DEFINED	-	7.20	0.50	1.000	-
USER-DEFINED	-	25.00	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.498
SUBAREA AREA(ACRES) = 75.60 SUBAREA RUNOFF(CFS) = 42.66
EFFECTIVE AREA(ACRES) = 1776.65 AREA-AVERAGED Fm(INCH/HR) = 0.37
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.74
TOTAL AREA(ACRES) = 6529.8 PEAK FLOW RATE(CFS) = 1503.81
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 26.71
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.876

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SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	0.10	0.50	0.850	-
USER-DEFINED	-	0.90	0.50	1.000	-
USER-DEFINED	-	0.30	0.50	0.600	-
USER-DEFINED	-	13.20	0.50	1.000	-
USER-DEFINED	-	0.50	0.50	0.200	-
USER-DEFINED	-	0.60	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.966
SUBAREA AREA(ACRES) = 15.60 SUBAREA RUNOFF(CFS) = 5.52
EFFECTIVE AREA(ACRES) = 1792.25 AREA-AVERAGED Fm(INCH/HR) = 0.37
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.74
TOTAL AREA(ACRES) = 6545.4 PEAK FLOW RATE(CFS) = 1503.81
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 26.71
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.876

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SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	33.90	0.50	0.100	-
USER-DEFINED	-	17.60	0.50	1.000	-
USER-DEFINED	-	16.80	0.50	1.000	-
USER-DEFINED	-	0.60	0.50	0.200	-
USER-DEFINED	-	1.50	0.50	0.400	-

```
  USER-DEFINED               -       10.00      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.603
  SUBAREA AREA(ACRES) =   80.40      SUBAREA RUNOFF(CFS) =   41.55
  EFFECTIVE AREA(ACRES) =   1872.65   AREA-AVERAGED Fm(INCH/HR) =  0.37
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.73
  TOTAL AREA(ACRES) =     6625.8       PEAK FLOW RATE(CFS) =    1503.81
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   26.71
  *   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               -        0.30      0.50     0.600     -
  USER-DEFINED               -        0.70      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.880
  SUBAREA AREA(ACRES) =    1.00      SUBAREA RUNOFF(CFS) =    0.39
  EFFECTIVE AREA(ACRES) =   1873.65   AREA-AVERAGED Fm(INCH/HR) =  0.37
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.73
  TOTAL AREA(ACRES) =     6626.8       PEAK FLOW RATE(CFS) =    1503.81
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   26.71
  *   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               -        0.30      0.50     1.000     -
  USER-DEFINED               -        0.80      0.50     1.000     -
  USER-DEFINED               -        0.50      0.50     1.000     -
  USER-DEFINED               -        0.20      0.50     1.000     -
  USER-DEFINED               -        0.30      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) =    2.10      SUBAREA RUNOFF(CFS) =    0.71
  EFFECTIVE AREA(ACRES) =   1875.75   AREA-AVERAGED Fm(INCH/HR) =  0.37
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.73
  TOTAL AREA(ACRES) =     6628.9       PEAK FLOW RATE(CFS) =    1503.81
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   26.71
```

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```
  *   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               -        1.20      0.50     1.000     -
  USER-DEFINED               -        0.50      0.50     1.000     -
  USER-DEFINED               -        1.70      0.50     0.850     -
  USER-DEFINED               -        7.20      0.50     1.000     -
  USER-DEFINED               -        1.00      0.50     1.000     -
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.50
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.978
  SUBAREA AREA(ACRES) =   11.60      SUBAREA RUNOFF(CFS) =    4.04
  EFFECTIVE AREA(ACRES) =   1887.35   AREA-AVERAGED Fm(INCH/HR) =  0.37
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap =  0.74
  TOTAL AREA(ACRES) =     6640.5       PEAK FLOW RATE(CFS) =    1503.81
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =     6640.5  TC(MIN.) =     26.71
  EFFECTIVE AREA(ACRES) =   1887.35  AREA-AVERAGED Fm(INCH/HR)=  0.37
  AREA-AVERAGED Fp(INCH/HR) =  0.50  AREA-AVERAGED Ap = 0.736
  PEAK FLOW RATE(CFS)   =    1503.81

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1     1503.81   26.71    0.876  0.50( 0.37) 0.74    1887.3     120.00
      2     1500.25   27.18    0.870  0.50( 0.37) 0.74    1926.4     110.00
      3     1448.09   35.16    0.758  0.50( 0.38) 0.75    2540.6     100.00
      4     1414.60   40.12    0.689  0.50( 0.38) 0.76    2889.0     150.00
      5     1332.73   53.42    0.589  0.50( 0.39) 0.79    3801.6   31100.00
      6     1239.90   71.09    0.509  0.50( 0.40) 0.79    5262.2   13100.00
      7     1212.73   73.61    0.500  0.50( 0.40) 0.79    5423.7   13200.00
      8     1204.30   74.13    0.498  0.50( 0.40) 0.79    5446.0   13210.00
      9      743.24  106.58    0.401  0.50( 0.40) 0.80    6614.9   13000.00
     10      681.19  111.39    0.390  0.50( 0.40) 0.80    6640.5   13010.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

HZ-31113.2

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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:




 ************************* DESCRIPTION OF STUDY *************************
* GOBERNADORA WATERSHED STUDY - RATIONAL METHOD                         *
* REGIONAL WATERSHED S33- FREE DRAINING - ULTIMATE CONDITION            *
* 10-YR EV AUGUST 2018 ROKAMOTO                                         *
 ************************************************************************

  FILE NAME: RU10EV33.DAT
  TIME/DATE OF STUDY: 14:16 08/29/2018
==============================================================================
  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
  *DATA BANK RAINFALL USED*
  *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: S31X10.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1716.14   38.98  0.30( 0.24) 0.81    2485.1   13100.00
      2     1689.35   68.05  0.30( 0.24) 0.81    3778.1   13000.00
      3     1657.69   70.37  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: S32X10.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      821.94   36.32  0.30( 0.25) 0.83    1125.1   13210.00
      2      821.47   36.44  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      821.94   36.32  0.30( 0.25) 0.83    1125.1   13210.00
      2      821.47   36.44  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      821.94   36.32    1.045  0.30( 0.25) 0.83    1125.1   13210.00
      2      821.47   36.44    1.043  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     1716.14   38.98    1.004  0.30( 0.24) 0.81    2485.1   13100.00
      2     1689.35   68.05    0.734  0.30( 0.24) 0.81    3778.1   13000.00
      3     1657.69   70.37    0.721  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     2506.47   36.32    1.045  0.30( 0.24) 0.82    3440.8   13210.00
      2     2507.47   36.44    1.043  0.30( 0.24) 0.82    3450.9   13200.00
      3     2497.58   38.98    1.004  0.30( 0.24) 0.82    3612.7   13100.00
      4     2191.70   68.05    0.734  0.30( 0.24) 0.81    4905.7   13000.00
```

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     5     2145.88   70.37    0.721  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) =     2507.47  Tc(MIN.) =   36.438
  EFFECTIVE AREA(ACRES) =   3450.86  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  13222.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13222.00 TO NODE  13222.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13222.00 TO NODE  13301.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    427.51  DOWNSTREAM(FEET) =    382.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2533.33   CHANNEL SLOPE =  0.0180
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.83
  *   5 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
  COMMERCIAL                 B        1.40      0.30     0.100    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       15.60      0.30     1.000    66
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.10      0.30     0.600    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        5.30      0.30     1.000    79
  NATURAL POOR COVER
  "BARREN"                   B        0.20      0.30     1.000    86
  COMMERCIAL                 B       22.60      0.30     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.521
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2524.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.73
  AVERAGE FLOW DEPTH(FEET) =   3.83   TRAVEL TIME(MIN.) =   3.93
  Tc(MIN.) =   40.37
  SUBAREA AREA(ACRES) =    45.20       SUBAREA RUNOFF(CFS) =   33.70
  EFFECTIVE AREA(ACRES) =   3496.06     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =     4969.6         PEAK FLOW RATE(CFS) =    2507.47
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

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  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   3.81

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.81   FLOW VELOCITY(FEET/SEC.) =  10.71
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13301.00 =   34659.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   40.37
  *   5 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
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        1.00      0.30     1.000    79
  NATURAL POOR COVER
  "BARREN"                   B        0.50      0.30     1.000    86
  COMMERCIAL                 B        7.40      0.30     0.100    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        4.70      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        2.90      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.596
  SUBAREA AREA(ACRES) =   16.50      SUBAREA RUNOFF(CFS) =   11.97
  EFFECTIVE AREA(ACRES) =   3512.56   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =     4986.1       PEAK FLOW RATE(CFS) =    2507.47
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   40.37
  *   5 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
  NATURAL POOR COVER
  "BARREN"                   B        1.30      0.30     1.000    86
  COMMERCIAL                 B        0.20      0.30     0.100    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        5.30      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.30      0.30     1.000    65
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.20      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.60      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.977
```

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HZ-31111

```
  SUBAREA AREA(ACRES) =    7.90      SUBAREA RUNOFF(CFS) =    4.92
  EFFECTIVE AREA(ACRES) =   3520.46   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =     4994.0       PEAK FLOW RATE(CFS) =    2507.47
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   40.37
  *   5 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
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        4.30      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.80      0.30     1.000    65
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        1.10      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        6.90      0.30     1.000    66
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        7.90      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        1.00      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   22.00      SUBAREA RUNOFF(CFS) =   13.56
  EFFECTIVE AREA(ACRES) =   3542.46   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =     5016.0       PEAK FLOW RATE(CFS) =    2507.47
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   40.37
  *   5 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
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.40      0.30     1.000    66
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B       14.60      0.30     1.000    79
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   15.00      SUBAREA RUNOFF(CFS) =    9.25
  EFFECTIVE AREA(ACRES) =   3557.46   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =     5031.0       PEAK FLOW RATE(CFS) =    2507.47
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

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****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  31100.00 TO NODE  31101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   317.00
  ELEVATION DATA: UPSTREAM(FEET) =    801.00  DOWNSTREAM(FEET) =    685.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.641
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.342
  SUBAREA Tc AND LOSS RATE 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"      B        0.50      0.30     1.000    63    8.64
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.30      0.30     1.000    66    8.64
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.30      0.30     1.000    66    8.64
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.02
  TOTAL AREA(ACRES) =      1.10   PEAK FLOW RATE(CFS) =      2.02

****************************************************************************
  FLOW PROCESS FROM NODE  31101.00 TO NODE  31102.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    685.00  DOWNSTREAM(FEET) =    655.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   135.00   CHANNEL SLOPE =  0.2222
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   5 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
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.50      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.10      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.70      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  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.) =   5.95
  AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   0.38
  Tc(MIN.) =    9.02
```

HZ-31100

HZ-31101

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  SUBAREA AREA(ACRES) =     1.30       SUBAREA RUNOFF(CFS) =    2.32
  EFFECTIVE AREA(ACRES) =      2.40     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        2.4         PEAK FLOW RATE(CFS) =       4.29

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.47   FLOW VELOCITY(FEET/SEC.) =   6.47
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31102.00 =     452.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31102.00 TO NODE  31103.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    655.00  DOWNSTREAM(FEET) =    630.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   203.00   CHANNEL SLOPE =  0.1232
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   5 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
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.30      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.10      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        1.90      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.69
  AVERAGE FLOW DEPTH(FEET) =   0.61   TRAVEL TIME(MIN.) =   0.59
  Tc(MIN.) =    9.61
  SUBAREA AREA(ACRES) =     2.30       SUBAREA RUNOFF(CFS) =    3.95
  EFFECTIVE AREA(ACRES) =      4.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        4.7         PEAK FLOW RATE(CFS) =       8.06

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.67   FLOW VELOCITY(FEET/SEC.) =   6.05
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31103.00 =     655.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31103.00 TO NODE  31104.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    630.00  DOWNSTREAM(FEET) =    605.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   321.00   CHANNEL SLOPE =  0.0779
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.090
  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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HZ-31103

```
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        1.10      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.50      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.52
  AVERAGE FLOW DEPTH(FEET) =   0.81   TRAVEL TIME(MIN.) =   0.97
  Tc(MIN.) =   10.58
  SUBAREA AREA(ACRES) =     3.60       SUBAREA RUNOFF(CFS) =    5.80
  EFFECTIVE AREA(ACRES) =      8.30     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        8.3         PEAK FLOW RATE(CFS) =      13.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.88   FLOW VELOCITY(FEET/SEC.) =   5.75
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31104.00 =     976.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31104.00 TO NODE  31105.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    605.00  DOWNSTREAM(FEET) =    585.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   288.00   CHANNEL SLOPE =  0.0694
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.006
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.70      0.30     1.000    63
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.60      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        3.00      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.10      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.98
  AVERAGE FLOW DEPTH(FEET) =   1.01   TRAVEL TIME(MIN.) =   0.80
  Tc(MIN.) =   11.39
  SUBAREA AREA(ACRES) =     6.40       SUBAREA RUNOFF(CFS) =    9.83
  EFFECTIVE AREA(ACRES) =     14.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       14.7         PEAK FLOW RATE(CFS) =      22.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.09   FLOW VELOCITY(FEET/SEC.) =   6.29
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31105.00 =    1264.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31105.00 TO NODE  31106.00 IS CODE =  51
```

HZ-31104

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    585.00  DOWNSTREAM(FEET) =    560.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   344.00   CHANNEL SLOPE =  0.0727
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   5 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
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.60      0.30     1.000    63
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        2.80      0.30     1.000    63
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.60      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.10      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.60      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        4.10      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      30.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.94
  AVERAGE FLOW DEPTH(FEET) =   1.21   TRAVEL TIME(MIN.) =   0.83
  Tc(MIN.) =   12.21
  SUBAREA AREA(ACRES) =    10.80       SUBAREA RUNOFF(CFS) =   15.83
  EFFECTIVE AREA(ACRES) =     25.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       25.5         PEAK FLOW RATE(CFS) =      37.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.31   FLOW VELOCITY(FEET/SEC.) =   7.29
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31106.00 =    1608.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31106.00 TO NODE  31107.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    560.00  DOWNSTREAM(FEET) =    530.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   619.00   CHANNEL SLOPE =  0.0485
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   5 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
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.80      0.30     1.000    63
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        1.90      0.30     1.000    63
  NATURAL FAIR COVER
```

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HZ-31106


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  "OPEN BRUSH"               B        1.50      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        8.20      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.70      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      47.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.65
  AVERAGE FLOW DEPTH(FEET) =   1.54   TRAVEL TIME(MIN.) =   1.55
  Tc(MIN.) =   13.76
  SUBAREA AREA(ACRES) =    15.10       SUBAREA RUNOFF(CFS) =   20.43
  EFFECTIVE AREA(ACRES) =     40.60     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.6         PEAK FLOW RATE(CFS) =      54.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.63   FLOW VELOCITY(FEET/SEC.) =   6.89
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31107.00 =    2227.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31107.00 TO NODE  31108.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    530.00  DOWNSTREAM(FEET) =    515.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   377.00   CHANNEL SLOPE =  0.0398
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.738
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.50      0.30     1.000    63
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        6.50      0.30     1.000    63
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        1.30      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        1.10      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        5.50      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        3.40      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      66.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.71
  AVERAGE FLOW DEPTH(FEET) =   1.82   TRAVEL TIME(MIN.) =   0.94
  Tc(MIN.) =   14.70
  SUBAREA AREA(ACRES) =    18.30       SUBAREA RUNOFF(CFS) =   23.68
  EFFECTIVE AREA(ACRES) =     58.90     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       58.9         PEAK FLOW RATE(CFS) =      76.21

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```

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```
  DEPTH(FEET) =  1.91   FLOW VELOCITY(FEET/SEC.) =   6.95
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31108.00 =    2604.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31108.00 TO NODE  31109.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    515.00  DOWNSTREAM(FEET) =    490.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   520.00   CHANNEL SLOPE =  0.0481
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   5 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
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.70      0.30     1.000    63
  NATURAL FAIR COVER
  "GRASS"                    B        2.20      0.30     1.000    69
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        3.10      0.30     1.000    66
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.90      0.30     1.000    65
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        7.40      0.30     1.000    63
  NATURAL FAIR COVER
  "GRASS"                    B        0.30      0.30     1.000    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      85.19
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.66
  AVERAGE FLOW DEPTH(FEET) =   1.93   TRAVEL TIME(MIN.) =   1.13
  Tc(MIN.) =   15.83
  SUBAREA AREA(ACRES) =    14.60       SUBAREA RUNOFF(CFS) =   17.96
  EFFECTIVE AREA(ACRES) =     73.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       73.5         PEAK FLOW RATE(CFS) =      90.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.97   FLOW VELOCITY(FEET/SEC.) =   7.80
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31109.00 =    3124.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31109.00 TO NODE  31109.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   15.83
  *   5 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
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       11.40      0.30     1.000    66
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        8.90      0.30     1.000    65
```

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```
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        1.90      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        9.20      0.30     1.000    66
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        1.40      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   32.80      SUBAREA RUNOFF(CFS) =   40.35
  EFFECTIVE AREA(ACRES) =    106.30   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =      106.3       PEAK FLOW RATE(CFS) =     130.76

****************************************************************************
  FLOW PROCESS FROM NODE  31109.00 TO NODE  31110.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    490.00  DOWNSTREAM(FEET) =    432.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1420.00   CHANNEL SLOPE =  0.0408
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   5 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
  NATURAL FAIR COVER
  "GRASS"                    B        0.80      0.30     1.000    69
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.60      0.30     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.10      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        1.30      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        4.00      0.30     1.000    65
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        1.50      0.30     1.000    63
  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) =     135.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.10
  AVERAGE FLOW DEPTH(FEET) =   2.36   TRAVEL TIME(MIN.) =   2.92
  Tc(MIN.) =   18.75
  SUBAREA AREA(ACRES) =     8.30       SUBAREA RUNOFF(CFS) =    9.08
  EFFECTIVE AREA(ACRES) =    114.60     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      114.6         PEAK FLOW RATE(CFS) =     130.76
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.33   FLOW VELOCITY(FEET/SEC.) =   8.03
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31110.00 =    4544.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31110.00 TO NODE  31110.00 IS CODE =  81
----------------------------------------------------------------------------
```

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```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  MAINLINE Tc(MIN.) =   18.75
  *   5 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
  NATURAL FAIR COVER
  "GRASS"                     B        0.30      0.30      1.000    69
  NATURAL FAIR COVER
  "OPEN BRUSH"                B        9.60      0.30      1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"          B        0.40      0.30      0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        6.20      0.30      1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"            B        3.90      0.30      1.000    65
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        1.40      0.30      1.000    79
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.998
  SUBAREA AREA(ACRES) =   21.80      SUBAREA RUNOFF(CFS) =   23.86
  EFFECTIVE AREA(ACRES) =    136.40   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =      136.4       PEAK FLOW RATE(CFS) =     149.21

********************************************************************************
  FLOW PROCESS FROM NODE  31110.00 TO NODE  13301.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    432.00  DOWNSTREAM(FEET) =    382.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1847.00   CHANNEL SLOPE =  0.0271
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.351
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL POOR COVER
  "BARREN"                    B        4.90      0.30      1.000    86
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        1.50      0.30      1.000    79
  RESIDENTIAL
  ".4 DWELLING/ACRE"          B        0.60      0.30      0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        2.50      0.30      1.000    79
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        5.30      0.30      1.000    79
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        3.30      0.30      1.000    79
  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) =     157.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.23
  AVERAGE FLOW DEPTH(FEET) =   2.70   TRAVEL TIME(MIN.) =   4.26
  Tc(MIN.) =   23.01
```

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```
  SUBAREA AREA(ACRES) =    18.10       SUBAREA RUNOFF(CFS) =   17.13
  EFFECTIVE AREA(ACRES) =    154.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      154.5         PEAK FLOW RATE(CFS) =     149.21
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.64   FLOW VELOCITY(FEET/SEC.) =   7.11
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  13301.00 =    6391.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 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      149.21   23.01    1.351  0.30( 0.30) 1.00     154.5   31100.00
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  13301.00 =    6391.00 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     2506.47   40.25    0.986  0.30( 0.24) 0.81    3547.4   13210.00
      2     2507.47   40.37    0.985  0.30( 0.24) 0.81    3557.5   13200.00
      3     2497.58   42.91    0.952  0.30( 0.24) 0.81    3719.3   13100.00
      4     2191.70   72.16    0.711  0.30( 0.24) 0.81    5012.3   13000.00
      5     2145.88   74.51    0.698  0.30( 0.24) 0.81    5031.0   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13301.00 =   34659.82 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     2285.03   23.01    1.351  0.30( 0.25) 0.83    2182.6   31100.00
      2     2603.96   40.25    0.986  0.30( 0.25) 0.82    3701.9   13210.00
      3     2604.74   40.37    0.985  0.30( 0.25) 0.82    3712.0   13200.00
      4     2590.14   42.91    0.952  0.30( 0.25) 0.82    3873.8   13100.00
      5     2250.02   72.16    0.711  0.30( 0.24) 0.82    5166.8   13000.00
      6     2202.40   74.51    0.698  0.30( 0.24) 0.82    5185.5   13010.00
    TOTAL AREA(ACRES) =      5185.5

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     2604.74  Tc(MIN.) =   40.371
  EFFECTIVE AREA(ACRES) =   3711.96  AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     5185.5
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13301.00 =   34659.82 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  12
--------------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
================================================================================

********************************************************************************
  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) =   5.27
  *   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
  NATURAL FAIR COVER
  "GRASS"                    B        9.42      0.30     1.000    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2607.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.52
  AVERAGE FLOW DEPTH(FEET) =   5.27   TRAVEL TIME(MIN.) =   2.53
  Tc(MIN.) =   42.90
  SUBAREA AREA(ACRES) =     9.42       SUBAREA RUNOFF(CFS) =    5.53
  EFFECTIVE AREA(ACRES) =   3721.38     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.82
  TOTAL AREA(ACRES) =     5194.9         PEAK FLOW RATE(CFS) =    2604.74
  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) =   5.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.26   FLOW VELOCITY(FEET/SEC.) =   7.53
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13302.00 =   35800.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13302.00 TO NODE  13302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   42.90
  *   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
  NATURAL POOR COVER
  "BARREN"                   B       13.80      0.30     1.000    86
  NATURAL POOR COVER
  "BARREN"                   B        2.60      0.30     1.000    86
  COMMERCIAL                 B        1.10      0.30     0.100    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        3.50      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        6.90      0.30     1.000    79
  NATURAL POOR COVER
  "BARREN"                   B        0.20      0.30     1.000    86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.952
  SUBAREA AREA(ACRES) =   28.10      SUBAREA RUNOFF(CFS) =   16.85
```

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  EFFECTIVE AREA(ACRES) =   3749.48   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     5223.0       PEAK FLOW RATE(CFS) =    2604.74
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13302.00 TO NODE  13302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   42.90
  *   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
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        0.10      0.30     1.000    79
  COMMERCIAL                 B        0.10      0.30     0.100    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        2.40      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        0.50      0.30     1.000    79
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.894
  SUBAREA AREA(ACRES) =     3.10      SUBAREA RUNOFF(CFS) =     1.91
  EFFECTIVE AREA(ACRES) =   3752.58   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     5226.1       PEAK FLOW RATE(CFS) =    2604.74
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13302.00 TO NODE  13302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   42.90
  *   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
  NATURAL POOR COVER
  "BARREN"                   B        0.10      0.30     1.000    86
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.60      0.30     1.000    66
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        3.10      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.40      0.30     1.000    65
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.20      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       13.80      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   20.20      SUBAREA RUNOFF(CFS) =   11.85
  EFFECTIVE AREA(ACRES) =   3772.78   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     5246.4       PEAK FLOW RATE(CFS) =    2604.74
```

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NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13302.00 TO NODE 13302.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 42.90
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.952
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SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL POOR COVER					
"ROW CROPS,CONTOURED"	B	34.60	0.30	1.000	79
NATURAL FAIR COVER					
"WOODLAND,GRASS"	B	2.40	0.30	1.000	65
NATURAL FAIR COVER					
"OPEN BRUSH"	B	22.60	0.30	1.000	66
AGRICULTURAL POOR COVER					
"ROW CROPS,CONTOURED"	B	11.60	0.30	1.000	79
APARTMENTS	B	0.40	0.30	0.200	56
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	B	4.80	0.30	1.000	63

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.996
SUBAREA AREA(ACRES) = 76.40 SUBAREA RUNOFF(CFS) = 44.90
EFFECTIVE AREA(ACRES) = 3849.18 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83
TOTAL AREA(ACRES) = 5322.8 PEAK FLOW RATE(CFS) = 2604.74
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13302.00 TO NODE 13302.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 42.90
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.952
HZ-206
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"GRASS"	B	1.60	0.30	1.000	69
NATURAL FAIR COVER					
"OPEN BRUSH"	B	46.40	0.30	1.000	66
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	B	0.10	0.30	0.200	56
AGRICULTURAL POOR COVER					
"ROW CROPS,CONTOURED"	B	60.70	0.30	1.000	79
NATURAL FAIR COVER					
"WOODLAND,GRASS"	B	5.80	0.30	1.000	65

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.999
SUBAREA AREA(ACRES) = 114.60 SUBAREA RUNOFF(CFS) = 67.25
EFFECTIVE AREA(ACRES) = 3963.78 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83
TOTAL AREA(ACRES) = 5437.4 PEAK FLOW RATE(CFS) = 2604.74
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
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) = 4.71
CHANNEL FLOW THRU SUBAREA(CFS) = 2604.74
FLOW VELOCITY(FEET/SEC.) = 8.62 FLOW DEPTH(FEET) = 4.71
TRAVEL TIME(MIN.) = 4.24 Tc(MIN.) = 47.14
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13303.00 = 37994.87 FEET.

****
FLOW PROCESS FROM NODE 13303.00 TO NODE 13303.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 47.14
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.903
HZ-207
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL POOR COVER					
"BARREN"	B	0.20	0.30	1.000	86
NATURAL FAIR COVER					
"WOODLAND,GRASS"	B	0.40	0.30	1.000	65
NATURAL POOR COVER					
"BARREN"	B	0.80	0.30	1.000	86
COMMERCIAL	B	1.40	0.30	0.100	56
NATURAL FAIR COVER					
"GRASS"	B	2.60	0.30	1.000	69
NATURAL FAIR COVER					
"OPEN BRUSH"	B	2.20	0.30	1.000	66

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.834
SUBAREA AREA(ACRES) = 7.60 SUBAREA RUNOFF(CFS) = 4.46
EFFECTIVE AREA(ACRES) = 3971.38 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83
TOTAL AREA(ACRES) = 5445.0 PEAK FLOW RATE(CFS) = 2604.74
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13303.00 TO NODE 13303.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 47.14
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.903
HZ-207
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL POOR COVER					
"ROW CROPS,CONTOURED"	B	3.10	0.30	1.000	79

```
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        3.40      0.30     1.000    65
  NATURAL POOR COVER
  "BARREN"                   B        0.50      0.30     1.000    86
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.20      0.30     1.000    63
  COMMERCIAL                 B        3.60      0.30     0.100    56
  NATURAL FAIR COVER
  "GRASS"                    B        4.00      0.30     1.000    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.781
  SUBAREA AREA(ACRES) =   14.80      SUBAREA RUNOFF(CFS) =    8.90
  EFFECTIVE AREA(ACRES) =   3986.18   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5459.8       PEAK FLOW RATE(CFS) =    2604.74
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   47.14
  *   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
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       14.60      0.30     1.000    66
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        6.30      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        3.70      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   24.60      SUBAREA RUNOFF(CFS) =   13.34
  EFFECTIVE AREA(ACRES) =   4010.78   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5484.4       PEAK FLOW RATE(CFS) =    2604.74
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   47.14
  *   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
  NATURAL POOR COVER
  "BARREN"                   B        0.50      0.30     1.000    86
  COMMERCIAL                 B        0.30      0.30     0.100    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.20      0.30     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.80      0.30     0.900    56
```

HZ-207

HZ-31113


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  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        1.60      0.30     1.000    79
  NATURAL POOR COVER
  "BARREN"                   B       31.90      0.30     1.000    86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.990
  SUBAREA AREA(ACRES) =   35.30      SUBAREA RUNOFF(CFS) =   19.24
  EFFECTIVE AREA(ACRES) =   4046.08   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5519.6       PEAK FLOW RATE(CFS) =    2604.74
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   47.14
  *   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
  COMMERCIAL                 B        1.70      0.30     0.100    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.30      0.30     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        2.60      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        5.50      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.20      0.30     1.000    65
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.20      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.830
  SUBAREA AREA(ACRES) =   10.50      SUBAREA RUNOFF(CFS) =    6.18
  EFFECTIVE AREA(ACRES) =   4056.58   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5530.1       PEAK FLOW RATE(CFS) =    2604.74
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   47.14
  *   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
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        1.30      0.30     0.900    56
  NATURAL POOR COVER
  "BARREN"                   B        0.30      0.30     1.000    86
  COMMERCIAL                 B        0.20      0.30     0.100    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.30      0.30     1.000    66
```

HZ-31113

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  RESIDENTIAL
  ".4 DWELLING/ACRE"          B        6.50      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        3.00      0.30     1.000    79
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.917
  SUBAREA AREA(ACRES) =   11.60      SUBAREA RUNOFF(CFS) =    6.55
  EFFECTIVE AREA(ACRES) =   4068.18   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5541.8       PEAK FLOW RATE(CFS) =    2604.74
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  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) =   5.46
  *   5 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
  PUBLIC PARK                 B       13.84      0.30     0.850    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.850
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2608.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.20
  AVERAGE FLOW DEPTH(FEET) =   5.46   TRAVEL TIME(MIN.) =   2.14
  Tc(MIN.) =   49.28
  SUBAREA AREA(ACRES) =    13.84       SUBAREA RUNOFF(CFS) =    7.79
  EFFECTIVE AREA(ACRES) =   4082.02     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.83
  TOTAL AREA(ACRES) =     5555.6         PEAK FLOW RATE(CFS) =    2604.74
  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) =   5.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.45   FLOW VELOCITY(FEET/SEC.) =   7.20
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13304.00 =   38920.27 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13304.00 TO NODE  13304.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   49.28
  *   5 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
  NATURAL POOR COVER
```

S33-05.5

HZ-31114

```
  "BARREN"                    B        7.80      0.30     1.000    86
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        1.70      0.30     1.000    79
  NATURAL POOR COVER
  "BARREN"                    B        9.40      0.30     1.000    86
  NATURAL FAIR COVER
  "OPEN BRUSH"                B        1.20      0.30     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"          B        0.10      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        2.60      0.30     1.000    79
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   22.80      SUBAREA RUNOFF(CFS) =   11.91
  EFFECTIVE AREA(ACRES) =   4104.82   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =     5578.4       PEAK FLOW RATE(CFS) =    2604.74
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13304.00 TO NODE  13304.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   49.28
  *   5 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
  NATURAL FAIR COVER
  "WOODLAND,GRASS"            B        0.20      0.30     1.000    65
  NATURAL FAIR COVER
  "OPEN BRUSH"                B        0.30      0.30     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"          B        0.20      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        2.70      0.30     1.000    79
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.994
  SUBAREA AREA(ACRES) =    3.40      SUBAREA RUNOFF(CFS) =    1.78
  EFFECTIVE AREA(ACRES) =   4108.22   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =     5581.8       PEAK FLOW RATE(CFS) =    2604.74
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  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) =   4.39
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.832
  SUBAREA LOSS RATE DATA(AMC  II):
```

HZ-31114

S33-05.6

```
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
NATURAL FAIR COVER
"GRASS"                    B       27.39      0.30      1.000    69
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2611.29
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.42
AVERAGE FLOW DEPTH(FEET) =   4.39   TRAVEL TIME(MIN.) =   5.25
Tc(MIN.) =   54.53
SUBAREA AREA(ACRES) =    27.39       SUBAREA RUNOFF(CFS) =   13.11
EFFECTIVE AREA(ACRES) =   4135.61     AREA-AVERAGED Fm(INCH/HR) =   0.25
AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.84
TOTAL AREA(ACRES) =     5609.2         PEAK FLOW RATE(CFS) =    2604.74
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) =   4.38

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  4.38   FLOW VELOCITY(FEET/SEC.) =   9.41
LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.00 =   41886.54 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
MAINLINE Tc(MIN.) =   54.53
*   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.832
SUBAREA LOSS RATE DATA(AMC  II):
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HZ-31115

```
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
NATURAL POOR COVER
"BARREN"                   B       18.40      0.30      1.000    86
NATURAL FAIR COVER
"MEADOWS"                  B        1.20      0.30      1.000    70
NATURAL FAIR COVER
"WOODLAND,GRASS"           B        0.10      0.30      1.000    65
NATURAL POOR COVER
"BARREN"                   B       26.60      0.30      1.000    86
COMMERCIAL                 B        3.90      0.30      0.100    56
AGRICULTURAL POOR COVER
"FALLOW"                   B        3.00      0.30      1.000    86
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.934
SUBAREA AREA(ACRES) =   53.20      SUBAREA RUNOFF(CFS) =   26.41
EFFECTIVE AREA(ACRES) =   4188.81   AREA-AVERAGED Fm(INCH/HR) =  0.25
AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
TOTAL AREA(ACRES) =     5662.4       PEAK FLOW RATE(CFS) =    2604.74
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
MAINLINE Tc(MIN.) =   54.53
```


HZ-31115

```
*   5 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
AGRICULTURAL POOR COVER
"ROW CROPS,CONTOURED"      B        1.10      0.30      1.000    79
NATURAL FAIR COVER
"WOODLAND,GRASS"           B        0.20      0.30      1.000    65
NATURAL POOR COVER
"BARREN"                   B       14.00      0.30      1.000    86
COMMERCIAL                 B        4.30      0.30      0.100    56
AGRICULTURAL POOR COVER
"FALLOW"                   B        5.30      0.30      1.000    86
NATURAL FAIR COVER
"GRASS"                    B        2.70      0.30      1.000    69
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.860
SUBAREA AREA(ACRES) =   27.60      SUBAREA RUNOFF(CFS) =   14.25
EFFECTIVE AREA(ACRES) =   4216.41   AREA-AVERAGED Fm(INCH/HR) =  0.25
AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
TOTAL AREA(ACRES) =     5690.0       PEAK FLOW RATE(CFS) =    2604.74
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
MAINLINE Tc(MIN.) =   54.53
```

HZ-31115

```
*   5 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
NATURAL FAIR COVER
"MEADOWS"                  B        3.20      0.30      1.000    70
NATURAL FAIR COVER
"OPEN BRUSH"               B        6.10      0.30      1.000    66
RESIDENTIAL
".4 DWELLING/ACRE"         B        7.50      0.30      0.900    56
AGRICULTURAL POOR COVER
"ROW CROPS,CONTOURED"      B        5.40      0.30      1.000    79
NATURAL FAIR COVER
"WOODLAND,GRASS"           B        1.60      0.30      1.000    65
NATURAL POOR COVER
"BARREN"                   B        1.90      0.30      1.000    86
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.971
SUBAREA AREA(ACRES) =   25.70      SUBAREA RUNOFF(CFS) =   12.50
EFFECTIVE AREA(ACRES) =   4242.11   AREA-AVERAGED Fm(INCH/HR) =  0.25
AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
TOTAL AREA(ACRES) =     5715.7       PEAK FLOW RATE(CFS) =    2604.74
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
```

HZ-31115

```
  MAINLINE Tc(MIN.) =   54.53
  *   5 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
  COMMERCIAL                 B        2.00      0.30      0.100    56
  AGRICULTURAL POOR COVER
  "FALLOW"                   B        3.70      0.30      1.000    86
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.10      0.30      1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        2.60      0.30      0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        0.20      0.30      1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.10      0.30      1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.807
  SUBAREA AREA(ACRES) =   10.70      SUBAREA RUNOFF(CFS) =    5.68
  EFFECTIVE AREA(ACRES) =   4252.81   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =     5726.4       PEAK FLOW RATE(CFS) =    2604.74
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
```

HZ-31115

```
  MAINLINE Tc(MIN.) =   54.53
  *   5 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
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.50      0.30      1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        8.20      0.30      0.900    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.906
  SUBAREA AREA(ACRES) =    8.70      SUBAREA RUNOFF(CFS) =    4.38
  EFFECTIVE AREA(ACRES) =   4261.51   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =     5735.1       PEAK FLOW RATE(CFS) =    2604.74
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 3A10EV.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)   (INCH/HR)          (ACRES)    NODE
      1      636.63   14.40  0.30( 0.13) 0.43     433.0     120.00
      2      635.90   14.67  0.30( 0.13) 0.43     437.5     110.00
      3      571.14   21.96  0.30( 0.13) 0.43     503.7     100.00
```



```
      4      532.11   25.15  0.30( 0.13) 0.43     510.2     150.00
    TOTAL AREA(ACRES) =      510.2

****************************************************************************
  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     2285.03   37.77    1.022  0.30( 0.26) 0.85    2732.1   31100.00
      2     2603.96   54.42    0.833  0.30( 0.25) 0.84    4251.5   13210.00
      3     2604.74   54.53    0.832  0.30( 0.25) 0.84    4261.5   13200.00
      4     2590.14   57.09    0.811  0.30( 0.25) 0.84    4423.4   13100.00
      5     2250.02   86.99    0.640  0.30( 0.25) 0.83    5716.4   13000.00
      6     2202.40   89.45    0.630  0.30( 0.25) 0.83    5735.1   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.00 =   41886.54 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      636.63   14.40    1.758  0.30( 0.13) 0.43     433.0     120.00
      2      635.90   14.67    1.739  0.30( 0.13) 0.43     437.5     110.00
      3      571.14   21.96    1.387  0.30( 0.13) 0.43     503.7     100.00
      4      532.11   25.15    1.285  0.30( 0.13) 0.43     510.2     150.00
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE  13305.00 =    9867.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1     2343.67   14.40    1.758  0.30( 0.22) 0.73    1474.8     120.00
      2     2353.95   14.67    1.739  0.30( 0.22) 0.73    1499.0     110.00
      3     2531.03   21.96    1.387  0.30( 0.23) 0.75    2092.2     100.00
      4     2574.69   25.15    1.285  0.30( 0.23) 0.76    2329.4     150.00
      5     2696.17   37.77    1.022  0.30( 0.24) 0.79    3242.3   31100.00
      6     2927.68   54.42    0.833  0.30( 0.24) 0.80    4761.7   13210.00
      7     2928.00   54.53    0.832  0.30( 0.24) 0.80    4771.7   13200.00
      8     2903.64   57.09    0.811  0.30( 0.24) 0.80    4933.6   13100.00
      9     2484.82   86.99    0.640  0.30( 0.24) 0.80    6226.6   13000.00
     10     2432.62   89.45    0.630  0.30( 0.24) 0.80    6245.3   13010.00
    TOTAL AREA(ACRES) =      6245.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     2928.00  Tc(MIN.) =   54.533
  EFFECTIVE AREA(ACRES) =   4771.71  AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.75
  TOTAL AREA(ACRES) =     6245.3
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.00 =   41886.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

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

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 FLOW PROCESS FROM NODE  13305.00 TO NODE  13306.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    315.00  DOWNSTREAM(FEET) =    245.50
 CHANNEL LENGTH THRU SUBAREA(FEET) =  4408.41   CHANNEL SLOPE =  0.0158
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   4.33
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.779
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 PUBLIC PARK                B       68.77      0.30     0.850    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.850
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    2944.21
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.80
 AVERAGE FLOW DEPTH(FEET) =   4.33   TRAVEL TIME(MIN.) =   6.80
 Tc(MIN.) =   61.34
 SUBAREA AREA(ACRES) =    68.77       SUBAREA RUNOFF(CFS) =   32.40
 EFFECTIVE AREA(ACRES) =   4840.48     AREA-AVERAGED Fm(INCH/HR) =   0.24
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
 TOTAL AREA(ACRES) =     6314.1         PEAK FLOW RATE(CFS) =    2928.00
 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) =   4.32

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.32   FLOW VELOCITY(FEET/SEC.) =  10.78
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13306.00 =   46294.95 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13306.00 TO NODE  13306.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   61.34
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.779
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL POOR COVER
 "BARREN"                   B       21.50      0.30     1.000    86
 COMMERCIAL                 B       15.30      0.30     0.100    56
 NATURAL FAIR COVER
 "GRASS"                    B        0.80      0.30     1.000    69
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 B        0.60      0.30     1.000    65
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B        8.00      0.30     0.900    56
 NATURAL FAIR COVER
 "WOODLAND,GRASS"           B        0.10      0.30     1.000    65
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.685
 SUBAREA AREA(ACRES) =   46.30      SUBAREA RUNOFF(CFS) =   23.87
```

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 EFFECTIVE AREA(ACRES) =   4886.78   AREA-AVERAGED Fm(INCH/HR) =  0.24
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.80
 TOTAL AREA(ACRES) =     6360.4       PEAK FLOW RATE(CFS) =    2928.00
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE  13306.00 TO NODE  13306.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   61.34
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.779
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL POOR COVER
 "BARREN"                   B       43.30      0.30     1.000    86
 COMMERCIAL                 B        4.90      0.30     0.100    56
 NATURAL FAIR COVER
 "GRASS"                    B        5.70      0.30     1.000    69
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 B        0.50      0.30     1.000    65
 PUBLIC PARK                B        1.10      0.30     0.850    56
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B        3.10      0.30     0.900    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.917
 SUBAREA AREA(ACRES) =   58.60      SUBAREA RUNOFF(CFS) =   26.56
 EFFECTIVE AREA(ACRES) =   4945.38   AREA-AVERAGED Fm(INCH/HR) =  0.24
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.80
 TOTAL AREA(ACRES) =     6419.0       PEAK FLOW RATE(CFS) =    2928.00
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE  13306.00 TO NODE  13306.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   61.34
 *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.779
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "WOODLAND,GRASS"           B        6.80      0.30     1.000    65
 NATURAL POOR COVER
 "BARREN"                   B        0.70      0.30     1.000    86
 COMMERCIAL                 B        1.10      0.30     0.100    56
 NATURAL FAIR COVER
 "GRASS"                    B        0.50      0.30     1.000    69
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 B        0.10      0.30     1.000    65
 PUBLIC PARK                B        0.50      0.30     0.850    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.890
 SUBAREA AREA(ACRES) =    9.70      SUBAREA RUNOFF(CFS) =    4.47
 EFFECTIVE AREA(ACRES) =   4955.08   AREA-AVERAGED Fm(INCH/HR) =  0.24
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.80
```

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  TOTAL AREA(ACRES) =     6428.7       PEAK FLOW RATE(CFS) =    2928.00
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13306.00 TO NODE  13306.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   61.34
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.779
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        2.20      0.30     0.900    56
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.10      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.904
  SUBAREA AREA(ACRES) =    2.30      SUBAREA RUNOFF(CFS) =    1.05
  EFFECTIVE AREA(ACRES) =   4957.38   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.80
  TOTAL AREA(ACRES) =     6431.0       PEAK FLOW RATE(CFS) =    2928.00
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  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) =   4.26
  CHANNEL FLOW THRU SUBAREA(CFS) =    2928.00
  FLOW VELOCITY(FEET/SEC.) =  10.95   FLOW DEPTH(FEET) =   4.26
  TRAVEL TIME(MIN.) =   2.35   Tc(MIN.) =   63.69
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13307.00 =   47838.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13307.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   63.69
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.762
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.20      0.30     0.100    56
  NATURAL FAIR COVER
  "GRASS"                    B        0.10      0.30     1.000    69
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        0.20      0.30     1.000    65
  NATURAL POOR COVER
  "BARREN"                   B        3.70      0.30     1.000    86
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  COMMERCIAL                 B        0.30      0.30     0.100    56
  NATURAL FAIR COVER
  "GRASS"                    B        3.20      0.30     1.000    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.942
  SUBAREA AREA(ACRES) =    7.70      SUBAREA RUNOFF(CFS) =    3.32
  EFFECTIVE AREA(ACRES) =   4965.08   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.80
  TOTAL AREA(ACRES) =     6438.7       PEAK FLOW RATE(CFS) =    2928.00
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13307.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   63.69
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.762
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        3.60      0.30     1.000    65
  NATURAL FAIR COVER
  "GRASS"                    B        1.90      0.30     1.000    69
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.60      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =    6.10      SUBAREA RUNOFF(CFS) =    2.54
  EFFECTIVE AREA(ACRES) =   4971.18   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.80
  TOTAL AREA(ACRES) =     6444.8       PEAK FLOW RATE(CFS) =    2928.00
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  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) =   5.11
  CHANNEL FLOW THRU SUBAREA(CFS) =    2928.00
  FLOW VELOCITY(FEET/SEC.) =   8.78   FLOW DEPTH(FEET) =   5.11
  TRAVEL TIME(MIN.) =   1.76   Tc(MIN.) =   65.44
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13308.00 =   48763.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   65.44
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.751
```

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SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "GRASS"	B	0.10	0.30	1.000	69
NATURAL FAIR COVER "OPEN BRUSH"	B	0.20	0.30	1.000	66
NATURAL FAIR COVER "WOODLAND,GRASS"	B	5.00	0.30	1.000	65
COMMERCIAL	B	3.20	0.30	0.100	56
NATURAL FAIR COVER "GRASS"	B	0.10	0.30	1.000	69
NATURAL FAIR COVER "OPEN BRUSH"	B	0.90	0.30	1.000	66

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.697
SUBAREA AREA(ACRES) = 9.50 SUBAREA RUNOFF(CFS) = 4.63
EFFECTIVE AREA(ACRES) = 4980.68 AREA-AVERAGED Fm(INCH/HR) = 0.24
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.80
TOTAL AREA(ACRES) = 6454.3 PEAK FLOW RATE(CFS) = 2928.00
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 65.44
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.751

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SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
APARTMENTS	B	0.30	0.30	0.200	56
NATURAL POOR COVER "BARREN"	B	0.20	0.30	1.000	86
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	B	1.00	0.30	1.000	63
COMMERCIAL	B	41.90	0.30	0.100	56
NATURAL FAIR COVER "GRASS"	B	7.20	0.30	1.000	69
NATURAL FAIR COVER "OPEN BRUSH"	B	25.00	0.30	1.000	66

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.498
SUBAREA AREA(ACRES) = 75.60 SUBAREA RUNOFF(CFS) = 40.91
EFFECTIVE AREA(ACRES) = 5056.28 AREA-AVERAGED Fm(INCH/HR) = 0.24
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.79
TOTAL AREA(ACRES) = 6529.9 PEAK FLOW RATE(CFS) = 2928.00
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 65.44
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.751
SUBAREA LOSS RATE DATA(AMC II):

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DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	B	0.10	0.30	0.850	56
AGRICULTURAL POOR COVER "ROW CROPS,CONTOURED"	B	0.90	0.30	1.000	79
SCHOOL	B	0.30	0.30	0.600	56
NATURAL FAIR COVER "WOODLAND,GRASS"	B	13.20	0.30	1.000	65
APARTMENTS	B	0.50	0.30	0.200	56
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	B	0.60	0.30	1.000	63

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.966
SUBAREA AREA(ACRES) = 15.60 SUBAREA RUNOFF(CFS) = 6.47
EFFECTIVE AREA(ACRES) = 5071.88 AREA-AVERAGED Fm(INCH/HR) = 0.24
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.79
TOTAL AREA(ACRES) = 6545.5 PEAK FLOW RATE(CFS) = 2928.00
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 65.44
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.751

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SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	33.90	0.30	0.100	56
NATURAL FAIR COVER "GRASS"	B	17.60	0.30	1.000	69
NATURAL FAIR COVER "OPEN BRUSH"	B	16.80	0.30	1.000	66
RESIDENTIAL "11+ DWELLINGS/ACRE"	B	0.60	0.30	0.200	56
RESIDENTIAL "8-10 DWELLINGS/ACRE"	B	1.50	0.30	0.400	56
AGRICULTURAL POOR COVER "ROW CROPS,CONTOURED"	B	10.00	0.30	1.000	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.603
SUBAREA AREA(ACRES) = 80.40 SUBAREA RUNOFF(CFS) = 41.22
EFFECTIVE AREA(ACRES) = 5152.28 AREA-AVERAGED Fm(INCH/HR) = 0.24
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.79
TOTAL AREA(ACRES) = 6625.9 PEAK FLOW RATE(CFS) = 2928.00
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 65.44
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.751
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN

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```
  SCHOOL                    B        0.30      0.30     0.600    56
  NATURAL FAIR COVER
  "WOODLAND,GRASS"          B        0.70      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.880
  SUBAREA AREA(ACRES) =    1.00      SUBAREA RUNOFF(CFS) =    0.44
  EFFECTIVE AREA(ACRES) =   5153.28   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.79
  TOTAL AREA(ACRES) =     6626.9       PEAK FLOW RATE(CFS) =    2928.00
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   65.44
  *   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
  NATURAL FAIR COVER
  "GRASS"                   B        0.30      0.30     1.000    69
  NATURAL FAIR COVER
  "WOODLAND,GRASS"          B        0.80      0.30     1.000    65
  NATURAL FAIR COVER
  "GRASS"                   B        0.50      0.30     1.000    69
  NATURAL FAIR COVER
  "WOODLAND,GRASS"          B        0.20      0.30     1.000    65
  NATURAL FAIR COVER
  "GRASS"                   B        0.30      0.30     1.000    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =    2.10      SUBAREA RUNOFF(CFS) =    0.85
  EFFECTIVE AREA(ACRES) =   5155.38   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.79
  TOTAL AREA(ACRES) =     6629.0       PEAK FLOW RATE(CFS) =    2928.00
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   65.44
  *   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
  NATURAL FAIR COVER
  "GRASS"                   B        1.20      0.30     1.000    69
  NATURAL FAIR COVER
  "OPEN BRUSH"              B        0.50      0.30     1.000    66
  PUBLIC PARK               B        1.70      0.30     0.850    56
  NATURAL FAIR COVER
  "WOODLAND,GRASS"          B        7.20      0.30     1.000    65
  NATURAL FAIR COVER
  "GRASS"                   B        1.00      0.30     1.000    69
```

HZ-31010.2

HZ-31113.2


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  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.978
  SUBAREA AREA(ACRES) =   11.60      SUBAREA RUNOFF(CFS) =    4.77
  EFFECTIVE AREA(ACRES) =   5166.98   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.79
  TOTAL AREA(ACRES) =     6640.6       PEAK FLOW RATE(CFS) =    2928.00
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =     6640.6  TC(MIN.) =     65.44
  EFFECTIVE AREA(ACRES) =   5166.98  AREA-AVERAGED Fm(INCH/HR)=  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.791
  PEAK FLOW RATE(CFS)   =    2928.00

  ** PEAK FLOW RATE TABLE **
   STREAM       Q       Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1     2343.67   26.09    1.259  0.30( 0.22) 0.73    1870.0     120.00
      2     2353.95   26.36    1.251  0.30( 0.22) 0.73    1894.3     110.00
      3     2531.03   33.37    1.096  0.30( 0.22) 0.75    2487.4     100.00
      4     2574.69   36.49    1.042  0.30( 0.23) 0.76    2724.7     150.00
      5     2696.17   48.96    0.884  0.30( 0.23) 0.78    3637.6   31100.00
      6     2927.68   65.33    0.751  0.30( 0.24) 0.79    5156.9   13210.00
      7     2928.00   65.44    0.751  0.30( 0.24) 0.79    5167.0   13200.00
      8     2903.64   68.03    0.734  0.30( 0.24) 0.79    5328.8   13100.00
      9     2484.82   98.49    0.597  0.30( 0.24) 0.79    6621.9   13000.00
     10     2432.62  101.04    0.588  0.30( 0.24) 0.79    6640.6   13010.00
============================================================================
============================================================================
  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:




 ************************ DESCRIPTION OF STUDY *************************
* GOBERNADORA WATERSHED STUDY - RATIONAL METHOD                        *
* REGIONAL WATERSHED S33- FREE DRAINING - ULTIMATE CONDITION           *
* 25-YR EV AUGUST 2018 ROKAMOTO                                       *
 ***********************************************************************

  FILE NAME: RU25EV33.DAT
  TIME/DATE OF STUDY: 14:15 08/29/2018
==============================================================================
  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
  *DATA BANK RAINFALL USED*
  *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: S31X25.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2430.28   35.90  0.30( 0.24) 0.81    2511.7   13100.00
      2     2369.04   61.85  0.30( 0.24) 0.81    3776.9   13000.00
      3     2335.36   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: S32X25.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1123.08   33.84  0.30( 0.25) 0.83    1121.8   13210.00
      2     1123.47   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     1123.08   33.84  0.30( 0.25) 0.83    1121.8   13210.00
      2     1123.47   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     1123.08   33.84    1.357  0.30( 0.25) 0.83    1121.8   13210.00
      2     1123.47   34.10    1.351  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     2430.28   35.90    1.312  0.30( 0.24) 0.81    2511.7   13100.00
      2     2369.04   61.85    0.961  0.30( 0.24) 0.81    3776.9   13000.00
      3     2335.36   64.17    0.941  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     3510.75   33.84    1.357  0.30( 0.24) 0.82    3489.4   13210.00
      2     3516.66   34.10    1.351  0.30( 0.24) 0.82    3513.4   13200.00
      3     3513.80   35.90    1.312  0.30( 0.24) 0.82    3639.3   13100.00
      4     3094.67   61.85    0.961  0.30( 0.24) 0.81    4904.5   13000.00
```

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     5     3040.51   64.17    0.941  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) =     3516.66  Tc(MIN.) =   34.097
  EFFECTIVE AREA(ACRES) =   3513.40  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  13222.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13222.00 TO NODE  13222.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13222.00 TO NODE  13301.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    427.51  DOWNSTREAM(FEET) =    382.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2533.33   CHANNEL SLOPE =  0.0180
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.63
  *  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
  COMMERCIAL                 B        1.40      0.30     0.100    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       15.60      0.30     1.000    66
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.10      0.30     0.600    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        5.30      0.30     1.000    79
  NATURAL POOR COVER
  "BARREN"                   B        0.20      0.30     1.000    86
  COMMERCIAL                 B       22.60      0.30     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.521
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3539.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.98
  AVERAGE FLOW DEPTH(FEET) =   4.63   TRAVEL TIME(MIN.) =   3.53
  Tc(MIN.) =   37.62
  SUBAREA AREA(ACRES) =    45.20       SUBAREA RUNOFF(CFS) =   45.59
  EFFECTIVE AREA(ACRES) =   3558.60     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =     4969.6         PEAK FLOW RATE(CFS) =    3516.66
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

S33-01


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  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   4.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.61   FLOW VELOCITY(FEET/SEC.) =  11.95
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13301.00 =   34659.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   37.62
  *  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
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        1.00      0.30     1.000    79
  NATURAL POOR COVER
  "BARREN"                   B        0.50      0.30     1.000    86
  COMMERCIAL                 B        7.40      0.30     0.100    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        4.70      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        2.90      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.596
  SUBAREA AREA(ACRES) =   16.50      SUBAREA RUNOFF(CFS) =   16.31
  EFFECTIVE AREA(ACRES) =   3575.10   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =     4986.1       PEAK FLOW RATE(CFS) =    3516.66
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   37.62
  *  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
  NATURAL POOR COVER
  "BARREN"                   B        1.30      0.30     1.000    86
  COMMERCIAL                 B        0.20      0.30     0.100    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        5.30      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.30      0.30     1.000    65
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.20      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.60      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.977
```

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  SUBAREA AREA(ACRES) =    7.90      SUBAREA RUNOFF(CFS) =    7.00
  EFFECTIVE AREA(ACRES) =   3583.00   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =     4994.0       PEAK FLOW RATE(CFS) =    3516.66
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   37.62
  *  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
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        4.30      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.80      0.30     1.000    65
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        1.10      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        6.90      0.30     1.000    66
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        7.90      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        1.00      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   22.00      SUBAREA RUNOFF(CFS) =   19.35
  EFFECTIVE AREA(ACRES) =   3605.00   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =     5016.0       PEAK FLOW RATE(CFS) =    3516.66
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   37.62
  *  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
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.40      0.30     1.000    66
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B       14.60      0.30     1.000    79
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   15.00      SUBAREA RUNOFF(CFS) =   13.19
  EFFECTIVE AREA(ACRES) =   3620.00   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =     5031.0       PEAK FLOW RATE(CFS) =    3516.66
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

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****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  31100.00 TO NODE  31101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   317.00
  ELEVATION DATA: UPSTREAM(FEET) =    801.00  DOWNSTREAM(FEET) =    685.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.641
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.967
  SUBAREA Tc AND LOSS RATE 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"      B        0.50      0.30     1.000    63    8.64
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.30      0.30     1.000    66    8.64
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.30      0.30     1.000    66    8.64
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      2.64
  TOTAL AREA(ACRES) =      1.10   PEAK FLOW RATE(CFS) =      2.64

****************************************************************************
  FLOW PROCESS FROM NODE  31101.00 TO NODE  31102.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    685.00  DOWNSTREAM(FEET) =    655.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   135.00   CHANNEL SLOPE =  0.2222
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  10 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
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.50      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.10      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.70      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.33
  AVERAGE FLOW DEPTH(FEET) =   0.47   TRAVEL TIME(MIN.) =   0.36
  Tc(MIN.) =    9.00
```

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HZ-31101

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  SUBAREA AREA(ACRES) =     1.30       SUBAREA RUNOFF(CFS) =    3.04
  EFFECTIVE AREA(ACRES) =      2.40     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        2.4         PEAK FLOW RATE(CFS) =       5.61

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.52   FLOW VELOCITY(FEET/SEC.) =   6.88
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31102.00 =     452.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31102.00 TO NODE  31103.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    655.00  DOWNSTREAM(FEET) =    630.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   203.00   CHANNEL SLOPE =  0.1232
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  10 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
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.30      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.10      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        1.90      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.12
  AVERAGE FLOW DEPTH(FEET) =   0.67   TRAVEL TIME(MIN.) =   0.55
  Tc(MIN.) =    9.55
  SUBAREA AREA(ACRES) =     2.30       SUBAREA RUNOFF(CFS) =    5.18
  EFFECTIVE AREA(ACRES) =      4.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        4.7         PEAK FLOW RATE(CFS) =      10.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOW VELOCITY(FEET/SEC.) =   6.49
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31103.00 =     655.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31103.00 TO NODE  31104.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    630.00  DOWNSTREAM(FEET) =    605.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   321.00   CHANNEL SLOPE =  0.0779
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.660
  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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HZ-31103

```
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        1.10      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.50      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.89
  AVERAGE FLOW DEPTH(FEET) =   0.90   TRAVEL TIME(MIN.) =   0.91
  Tc(MIN.) =   10.46
  SUBAREA AREA(ACRES) =     3.60       SUBAREA RUNOFF(CFS) =    7.65
  EFFECTIVE AREA(ACRES) =      8.30     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        8.3         PEAK FLOW RATE(CFS) =      17.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.97   FLOW VELOCITY(FEET/SEC.) =   6.20
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31104.00 =     976.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31104.00 TO NODE  31105.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    605.00  DOWNSTREAM(FEET) =    585.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   288.00   CHANNEL SLOPE =  0.0694
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.557
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.70      0.30     1.000    63
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.60      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        3.00      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.10      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      24.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.43
  AVERAGE FLOW DEPTH(FEET) =   1.12   TRAVEL TIME(MIN.) =   0.75
  Tc(MIN.) =   11.20
  SUBAREA AREA(ACRES) =     6.40       SUBAREA RUNOFF(CFS) =   13.00
  EFFECTIVE AREA(ACRES) =     14.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       14.7         PEAK FLOW RATE(CFS) =      29.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.21   FLOW VELOCITY(FEET/SEC.) =   6.79
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31105.00 =    1264.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31105.00 TO NODE  31106.00 IS CODE =  51
```

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----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    585.00  DOWNSTREAM(FEET) =    560.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   344.00   CHANNEL SLOPE =  0.0727
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.461
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.60      0.30     1.000    63
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        2.80      0.30     1.000    63
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.60      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.10      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.60      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        4.10      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      40.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.43
  AVERAGE FLOW DEPTH(FEET) =   1.35   TRAVEL TIME(MIN.) =   0.77
  Tc(MIN.) =   11.98
  SUBAREA AREA(ACRES) =    10.80       SUBAREA RUNOFF(CFS) =   21.00
  EFFECTIVE AREA(ACRES) =     25.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       25.5         PEAK FLOW RATE(CFS) =      49.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.45   FLOW VELOCITY(FEET/SEC.) =   7.82
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31106.00 =    1608.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31106.00 TO NODE  31107.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    560.00  DOWNSTREAM(FEET) =    530.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   619.00   CHANNEL SLOPE =  0.0485
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  10 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
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.80      0.30     1.000    63
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        1.90      0.30     1.000    63
  NATURAL FAIR COVER
```

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HZ-31106


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  "OPEN BRUSH"               B        1.50      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        8.20      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.70      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      63.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.13
  AVERAGE FLOW DEPTH(FEET) =   1.72   TRAVEL TIME(MIN.) =   1.45
  Tc(MIN.) =   13.42
  SUBAREA AREA(ACRES) =    15.10       SUBAREA RUNOFF(CFS) =   27.25
  EFFECTIVE AREA(ACRES) =     40.60     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.6         PEAK FLOW RATE(CFS) =      73.27

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.82   FLOW VELOCITY(FEET/SEC.) =   7.38
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31107.00 =    2227.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31107.00 TO NODE  31108.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    530.00  DOWNSTREAM(FEET) =    515.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   377.00   CHANNEL SLOPE =  0.0398
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  10 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
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.50      0.30     1.000    63
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        6.50      0.30     1.000    63
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        1.30      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        1.10      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        5.50      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        3.40      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      89.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.23
  AVERAGE FLOW DEPTH(FEET) =   2.03   TRAVEL TIME(MIN.) =   0.87
  Tc(MIN.) =   14.29
  SUBAREA AREA(ACRES) =    18.30       SUBAREA RUNOFF(CFS) =   31.69
  EFFECTIVE AREA(ACRES) =     58.90     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       58.9         PEAK FLOW RATE(CFS) =     101.98

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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```
  DEPTH(FEET) =  2.13   FLOW VELOCITY(FEET/SEC.) =   7.47
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31108.00 =    2604.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31108.00 TO NODE  31109.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    515.00  DOWNSTREAM(FEET) =    490.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   520.00   CHANNEL SLOPE =  0.0481
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  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
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.70      0.30     1.000    63
  NATURAL FAIR COVER
  "GRASS"                    B        2.20      0.30     1.000    69
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        3.10      0.30     1.000    66
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.90      0.30     1.000    65
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        7.40      0.30     1.000    63
  NATURAL FAIR COVER
  "GRASS"                    B        0.30      0.30     1.000    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     114.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.25
  AVERAGE FLOW DEPTH(FEET) =   2.15   TRAVEL TIME(MIN.) =   1.05
  Tc(MIN.) =   15.34
  SUBAREA AREA(ACRES) =    14.60       SUBAREA RUNOFF(CFS) =   24.12
  EFFECTIVE AREA(ACRES) =     73.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       73.5         PEAK FLOW RATE(CFS) =     121.40

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.20   FLOW VELOCITY(FEET/SEC.) =   8.36
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31109.00 =    3124.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31109.00 TO NODE  31109.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   15.34
  *  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
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       11.40      0.30     1.000    66
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        8.90      0.30     1.000    65
```

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```
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        1.90      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        9.20      0.30     1.000    66
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        1.40      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   32.80      SUBAREA RUNOFF(CFS) =   54.18
  EFFECTIVE AREA(ACRES) =    106.30   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =      106.3       PEAK FLOW RATE(CFS) =     175.58

****************************************************************************
  FLOW PROCESS FROM NODE  31109.00 TO NODE  31110.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    490.00  DOWNSTREAM(FEET) =    432.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1420.00   CHANNEL SLOPE =  0.0408
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.945
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "GRASS"                    B        0.80      0.30     1.000    69
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.60      0.30     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.10      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        1.30      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        4.00      0.30     1.000    65
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        1.50      0.30     1.000    63
  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) =     181.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.71
  AVERAGE FLOW DEPTH(FEET) =   2.64   TRAVEL TIME(MIN.) =   2.72
  Tc(MIN.) =   18.06
  SUBAREA AREA(ACRES) =     8.30       SUBAREA RUNOFF(CFS) =   12.29
  EFFECTIVE AREA(ACRES) =    114.60     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      114.6         PEAK FLOW RATE(CFS) =     175.58
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.60   FLOW VELOCITY(FEET/SEC.) =   8.63
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31110.00 =    4544.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31110.00 TO NODE  31110.00 IS CODE =  81
----------------------------------------------------------------------------
```

HZ-31109

```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  MAINLINE Tc(MIN.) =   18.06                                    HZ-31109
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.945
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "GRASS"                     B        0.30      0.30      1.000    69
  NATURAL FAIR COVER
  "OPEN BRUSH"                B        9.60      0.30      1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"          B        0.40      0.30      0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        6.20      0.30      1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"            B        3.90      0.30      1.000    65
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        1.40      0.30      1.000    79
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.998
  SUBAREA AREA(ACRES) =   21.80      SUBAREA RUNOFF(CFS) =   32.28
  EFFECTIVE AREA(ACRES) =    136.40   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =      136.4       PEAK FLOW RATE(CFS) =     201.93

********************************************************************************
  FLOW PROCESS FROM NODE  31110.00 TO NODE  13301.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    432.00  DOWNSTREAM(FEET) =    382.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1847.00   CHANNEL SLOPE =  0.0271
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00      HZ-31110
  *  10 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
  NATURAL POOR COVER
  "BARREN"                    B        4.90      0.30      1.000    86
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        1.50      0.30      1.000    79
  RESIDENTIAL
  ".4 DWELLING/ACRE"          B        0.60      0.30      0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        2.50      0.30      1.000    79
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        5.30      0.30      1.000    79
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        3.30      0.30      1.000    79
  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) =     213.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.78
  AVERAGE FLOW DEPTH(FEET) =   3.03   TRAVEL TIME(MIN.) =   3.96
  Tc(MIN.) =   22.02
```



```
  SUBAREA AREA(ACRES) =    18.10       SUBAREA RUNOFF(CFS) =   23.41
  EFFECTIVE AREA(ACRES) =    154.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      154.5         PEAK FLOW RATE(CFS) =     201.93
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.96   FLOW VELOCITY(FEET/SEC.) =   7.67
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  13301.00 =    6391.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 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      201.93   22.02    1.736  0.30( 0.30) 1.00     154.5   31100.00
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  13301.00 =    6391.00 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     3510.75   37.36    1.282  0.30( 0.24) 0.81    3596.0   13210.00
      2     3516.66   37.62    1.277  0.30( 0.24) 0.81    3620.0   13200.00
      3     3513.80   39.42    1.243  0.30( 0.24) 0.81    3745.9   13100.00
      4     3095.11   65.52    0.929  0.30( 0.24) 0.81    5011.1   13000.00
      5     3040.51   67.87    0.911  0.30( 0.24) 0.81    5031.0   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13301.00 =   34659.82 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3175.07   22.02    1.736  0.30( 0.25) 0.83    2273.7   31100.00
      2     3648.88   37.36    1.282  0.30( 0.25) 0.82    3750.5   13210.00
      3     3654.08   37.62    1.277  0.30( 0.25) 0.82    3774.5   13200.00
      4     3646.46   39.42    1.243  0.30( 0.25) 0.82    3900.4   13100.00
      5     3183.63   65.52    0.929  0.30( 0.24) 0.82    5165.6   13000.00
      6     3126.42   67.87    0.911  0.30( 0.24) 0.82    5185.5   13010.00
    TOTAL AREA(ACRES) =      5185.5

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     3654.08  Tc(MIN.) =   37.622
  EFFECTIVE AREA(ACRES) =   3774.50  AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     5185.5
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13301.00 =   34659.82 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  12
--------------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
================================================================================

********************************************************************************
  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) =   6.34
  *  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
  NATURAL FAIR COVER
  "GRASS"                    B        9.42      0.30     1.000    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3658.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.35
  AVERAGE FLOW DEPTH(FEET) =   6.34   TRAVEL TIME(MIN.) =   2.28
  Tc(MIN.) =   39.90
  SUBAREA AREA(ACRES) =     9.42       SUBAREA RUNOFF(CFS) =    7.93
  EFFECTIVE AREA(ACRES) =   3783.92     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.82
  TOTAL AREA(ACRES) =     5194.9         PEAK FLOW RATE(CFS) =    3654.08
  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) =   6.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.34   FLOW VELOCITY(FEET/SEC.) =   8.35
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13302.00 =   35800.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13302.00 TO NODE  13302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   39.90
  *  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
  NATURAL POOR COVER
  "BARREN"                   B       13.80      0.30     1.000    86
  NATURAL POOR COVER
  "BARREN"                   B        2.60      0.30     1.000    86
  COMMERCIAL                 B        1.10      0.30     0.100    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        3.50      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        6.90      0.30     1.000    79
  NATURAL POOR COVER
  "BARREN"                   B        0.20      0.30     1.000    86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.952
  SUBAREA AREA(ACRES) =   28.10      SUBAREA RUNOFF(CFS) =   24.01
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  EFFECTIVE AREA(ACRES) =   3812.02   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     5223.0       PEAK FLOW RATE(CFS) =    3654.08
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13302.00 TO NODE  13302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   39.90
  *  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
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        0.10      0.30     1.000    79
  COMMERCIAL                 B        0.10      0.30     0.100    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        2.40      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        0.50      0.30     1.000    79
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.894
  SUBAREA AREA(ACRES) =     3.10      SUBAREA RUNOFF(CFS) =     2.70
  EFFECTIVE AREA(ACRES) =   3815.12   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     5226.1       PEAK FLOW RATE(CFS) =    3654.08
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13302.00 TO NODE  13302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   39.90
  *  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
  NATURAL POOR COVER
  "BARREN"                   B        0.10      0.30     1.000    86
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.60      0.30     1.000    66
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        3.10      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.40      0.30     1.000    65
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.20      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       13.80      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   20.20      SUBAREA RUNOFF(CFS) =   17.00
  EFFECTIVE AREA(ACRES) =   3835.32   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     5246.4       PEAK FLOW RATE(CFS) =    3654.08
```

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  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13302.00 TO NODE  13302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   39.90
  *  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
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B       34.60      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        2.40      0.30     1.000    65
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       22.60      0.30     1.000    66
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B       11.60      0.30     1.000    79
  APARTMENTS                 B        0.40      0.30     0.200    56
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        4.80      0.30     1.000    63
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.996
  SUBAREA AREA(ACRES) =   76.40      SUBAREA RUNOFF(CFS) =   64.37
  EFFECTIVE AREA(ACRES) =   3911.72   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5322.8       PEAK FLOW RATE(CFS) =    3654.08
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13302.00 TO NODE  13302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   39.90
  *  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
  NATURAL FAIR COVER
  "GRASS"                    B        1.60      0.30     1.000    69
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       46.40      0.30     1.000    66
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        0.10      0.30     0.200    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B       60.70      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        5.80      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.999
  SUBAREA AREA(ACRES) =  114.60      SUBAREA RUNOFF(CFS) =   96.45
  EFFECTIVE AREA(ACRES) =   4026.32   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5437.4       PEAK FLOW RATE(CFS) =    3654.08
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

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****************************************************************************
  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) =   5.69
  CHANNEL FLOW THRU SUBAREA(CFS) =    3654.08
  FLOW VELOCITY(FEET/SEC.) =   9.58   FLOW DEPTH(FEET) =   5.69
  TRAVEL TIME(MIN.) =   3.82   Tc(MIN.) =   43.72
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13303.00 =   37994.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   43.72
  *  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
  NATURAL POOR COVER
  "BARREN"                   B        0.20      0.30     1.000    86
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.40      0.30     1.000    65
  NATURAL POOR COVER
  "BARREN"                   B        0.80      0.30     1.000    86
  COMMERCIAL                 B        1.40      0.30     0.100    56
  NATURAL FAIR COVER
  "GRASS"                    B        2.60      0.30     1.000    69
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.20      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.834
  SUBAREA AREA(ACRES) =    7.60      SUBAREA RUNOFF(CFS) =    6.30
  EFFECTIVE AREA(ACRES) =   4033.92   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5445.0       PEAK FLOW RATE(CFS) =    3654.08
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   43.72
  *  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
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        3.10      0.30     1.000    79
```

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```
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        3.40      0.30     1.000    65
  NATURAL POOR COVER
  "BARREN"                   B        0.50      0.30     1.000    86
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.20      0.30     1.000    63
  COMMERCIAL                 B        3.60      0.30     0.100    56
  NATURAL FAIR COVER
  "GRASS"                    B        4.00      0.30     1.000    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.781
  SUBAREA AREA(ACRES) =   14.80      SUBAREA RUNOFF(CFS) =   12.49
  EFFECTIVE AREA(ACRES) =   4048.72   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5459.8       PEAK FLOW RATE(CFS) =    3654.08
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   43.72
  *  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
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       14.60      0.30     1.000    66
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        6.30      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        3.70      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   24.60      SUBAREA RUNOFF(CFS) =   19.30
  EFFECTIVE AREA(ACRES) =   4073.32   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5484.4       PEAK FLOW RATE(CFS) =    3654.08
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   43.72
  *  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
  NATURAL POOR COVER
  "BARREN"                   B        0.50      0.30     1.000    86
  COMMERCIAL                 B        0.30      0.30     0.100    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.20      0.30     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.80      0.30     0.900    56
```

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HZ-31113


```
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        1.60      0.30     1.000    79
  NATURAL POOR COVER
  "BARREN"                   B       31.90      0.30     1.000    86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.990
  SUBAREA AREA(ACRES) =   35.30      SUBAREA RUNOFF(CFS) =   27.79
  EFFECTIVE AREA(ACRES) =   4108.62   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5519.6       PEAK FLOW RATE(CFS) =    3654.08
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   43.72
  *  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
  COMMERCIAL                 B        1.70      0.30     0.100    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.30      0.30     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        2.60      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        5.50      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.20      0.30     1.000    65
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.20      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.830
  SUBAREA AREA(ACRES) =   10.50      SUBAREA RUNOFF(CFS) =    8.72
  EFFECTIVE AREA(ACRES) =   4119.12   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5530.1       PEAK FLOW RATE(CFS) =    3654.08
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   43.72
  *  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
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        1.30      0.30     0.900    56
  NATURAL POOR COVER
  "BARREN"                   B        0.30      0.30     1.000    86
  COMMERCIAL                 B        0.20      0.30     0.100    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.30      0.30     1.000    66
```

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```
  RESIDENTIAL
  ".4 DWELLING/ACRE"          B        6.50      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        3.00      0.30     1.000    79
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.917
  SUBAREA AREA(ACRES) =   11.60      SUBAREA RUNOFF(CFS) =    9.36
  EFFECTIVE AREA(ACRES) =   4130.72   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5541.8       PEAK FLOW RATE(CFS) =    3654.08
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  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) =   6.57
  *  10 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
  PUBLIC PARK               B       13.84      0.30     0.850    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.850
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    3659.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.99
  AVERAGE FLOW DEPTH(FEET) =   6.57   TRAVEL TIME(MIN.) =   1.93
  Tc(MIN.) =   45.65
  SUBAREA AREA(ACRES) =    13.84       SUBAREA RUNOFF(CFS) =   11.06
  EFFECTIVE AREA(ACRES) =   4144.56     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.83
  TOTAL AREA(ACRES) =     5555.6         PEAK FLOW RATE(CFS) =    3654.08
  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) =   6.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.57   FLOW VELOCITY(FEET/SEC.) =   7.98
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13304.00 =   38920.27 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13304.00 TO NODE  13304.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   45.65
  *  10 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
  NATURAL POOR COVER
```

S33-05.5

HZ-31114

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  "BARREN"                    B        7.80      0.30     1.000    86
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        1.70      0.30     1.000    79
  NATURAL POOR COVER
  "BARREN"                    B        9.40      0.30     1.000    86
  NATURAL FAIR COVER
  "OPEN BRUSH"                B        1.20      0.30     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"          B        0.10      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        2.60      0.30     1.000    79
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   22.80      SUBAREA RUNOFF(CFS) =   17.31
  EFFECTIVE AREA(ACRES) =   4167.36   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5578.4       PEAK FLOW RATE(CFS) =    3654.08
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13304.00 TO NODE  13304.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   45.65
  *  10 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
  NATURAL FAIR COVER
  "WOODLAND,GRASS"            B        0.20      0.30     1.000    65
  NATURAL FAIR COVER
  "OPEN BRUSH"                B        0.30      0.30     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"          B        0.20      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        2.70      0.30     1.000    79
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.994
  SUBAREA AREA(ACRES) =    3.40      SUBAREA RUNOFF(CFS) =    2.59
  EFFECTIVE AREA(ACRES) =   4170.76   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5581.8       PEAK FLOW RATE(CFS) =    3654.08
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  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) =   5.31
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.081
  SUBAREA LOSS RATE DATA(AMC  II):
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HZ-31114

S33-05.6

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"GRASS"	B	27.39	0.30	1.000	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3663.70
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.48
AVERAGE FLOW DEPTH(FEET) = 5.31 TRAVEL TIME(MIN.) = 4.72
Tc(MIN.) = 50.37
SUBAREA AREA(ACRES) = 27.39 SUBAREA RUNOFF(CFS) = 19.24
EFFECTIVE AREA(ACRES) = 4198.15 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.84
TOTAL AREA(ACRES) = 5609.2 PEAK FLOW RATE(CFS) = 3654.08
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) = 5.30

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 5.30 FLOW VELOCITY(FEET/SEC.) = 10.47
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.54 FEET.

****

FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

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HZ-31115

MAINLINE Tc(MIN.) = 50.37
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.081
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL POOR COVER					
"BARREN"	B	18.40	0.30	1.000	86
NATURAL FAIR COVER					
"MEADOWS"	B	1.20	0.30	1.000	70
NATURAL FAIR COVER					
"WOODLAND,GRASS"	B	0.10	0.30	1.000	65
NATURAL POOR COVER					
"BARREN"	B	26.60	0.30	1.000	86
COMMERCIAL	B	3.90	0.30	0.100	56
AGRICULTURAL POOR COVER					
"FALLOW"	B	3.00	0.30	1.000	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.934
SUBAREA AREA(ACRES) = 53.20 SUBAREA RUNOFF(CFS) = 38.32
EFFECTIVE AREA(ACRES) = 4251.35 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.84
TOTAL AREA(ACRES) = 5662.4 PEAK FLOW RATE(CFS) = 3654.08
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****

FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

==========

MAINLINE Tc(MIN.) = 50.37

HZ-31115

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.081
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL POOR COVER					
"ROW CROPS,CONTOURED"	B	1.10	0.30	1.000	79
NATURAL FAIR COVER					
"WOODLAND,GRASS"	B	0.20	0.30	1.000	65
NATURAL POOR COVER					
"BARREN"	B	14.00	0.30	1.000	86
COMMERCIAL	B	4.30	0.30	0.100	56
AGRICULTURAL POOR COVER					
"FALLOW"	B	5.30	0.30	1.000	86
NATURAL FAIR COVER					
"GRASS"	B	2.70	0.30	1.000	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.860
SUBAREA AREA(ACRES) = 27.60 SUBAREA RUNOFF(CFS) = 20.43
EFFECTIVE AREA(ACRES) = 4278.95 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.84
TOTAL AREA(ACRES) = 5690.0 PEAK FLOW RATE(CFS) = 3654.08
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****

FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

==========

HZ-31115

MAINLINE Tc(MIN.) = 50.37
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.081
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"MEADOWS"	B	3.20	0.30	1.000	70
NATURAL FAIR COVER					
"OPEN BRUSH"	B	6.10	0.30	1.000	66
RESIDENTIAL					
".4 DWELLING/ACRE"	B	7.50	0.30	0.900	56
AGRICULTURAL POOR COVER					
"ROW CROPS,CONTOURED"	B	5.40	0.30	1.000	79
NATURAL FAIR COVER					
"WOODLAND,GRASS"	B	1.60	0.30	1.000	65
NATURAL POOR COVER					
"BARREN"	B	1.90	0.30	1.000	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.971
SUBAREA AREA(ACRES) = 25.70 SUBAREA RUNOFF(CFS) = 18.26
EFFECTIVE AREA(ACRES) = 4304.65 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.84
TOTAL AREA(ACRES) = 5715.7 PEAK FLOW RATE(CFS) = 3654.08
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****

FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

==========

HZ-31115

```
  MAINLINE Tc(MIN.) =   50.37
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.081
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        2.00      0.30      0.100    56
  AGRICULTURAL POOR COVER
  "FALLOW"                   B        3.70      0.30      1.000    86
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.10      0.30      1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        2.60      0.30      0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        0.20      0.30      1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.10      0.30      1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.807
  SUBAREA AREA(ACRES) =   10.70      SUBAREA RUNOFF(CFS) =    8.07
  EFFECTIVE AREA(ACRES) =   4315.35   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =     5726.4       PEAK FLOW RATE(CFS) =    3654.08
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
```

HZ-31115

```
  MAINLINE Tc(MIN.) =   50.37
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.081
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.50      0.30      1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        8.20      0.30      0.900    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.906
  SUBAREA AREA(ACRES) =    8.70      SUBAREA RUNOFF(CFS) =    6.33
  EFFECTIVE AREA(ACRES) =   4324.05   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =     5735.1       PEAK FLOW RATE(CFS) =    3654.08
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 3A25EV.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      831.13   13.97  0.30( 0.13) 0.43     434.6     120.00
      2      830.43   14.16  0.30( 0.13) 0.43     437.8     110.00
      3      746.53   21.22  0.30( 0.13) 0.43     504.3     100.00
```



```
      4      699.51   24.00  0.30( 0.13) 0.43     510.2     150.00
    TOTAL AREA(ACRES) =      510.2

****************************************************************************
  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     3175.07   35.32    1.324  0.30( 0.26) 0.85    2823.2   31100.00
      2     3648.88   50.11    1.084  0.30( 0.25) 0.84    4300.0   13210.00
      3     3654.08   50.37    1.081  0.30( 0.25) 0.84    4324.0   13200.00
      4     3646.46   52.18    1.059  0.30( 0.25) 0.84    4449.9   13100.00
      5     3234.29   78.76    0.836  0.30( 0.25) 0.83    5715.2   13000.00
      6     3160.06   81.20    0.822  0.30( 0.25) 0.83    5735.1   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.00 =   41886.54 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      831.13   13.97    2.253  0.30( 0.13) 0.43     434.6     120.00
      2      830.43   14.16    2.236  0.30( 0.13) 0.43     437.8     110.00
      3      746.53   21.22    1.773  0.30( 0.13) 0.43     504.3     100.00
      4      699.51   24.00    1.652  0.30( 0.13) 0.43     510.2     150.00
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE  13305.00 =    9867.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1     3178.56   13.97    2.253  0.30( 0.22) 0.73    1551.4     120.00
      2     3188.93   14.16    2.236  0.30( 0.22) 0.73    1569.6     110.00
      3     3455.52   21.22    1.773  0.30( 0.23) 0.75    2200.7     100.00
      4     3519.57   24.00    1.652  0.30( 0.23) 0.76    2428.8     150.00
      5     3723.83   35.32    1.324  0.30( 0.24) 0.79    3333.4   31100.00
      6     4087.10   50.11    1.084  0.30( 0.24) 0.80    4810.2   13210.00
      7     4090.87   50.37    1.081  0.30( 0.24) 0.80    4834.2   13200.00
      8     4073.32   52.18    1.059  0.30( 0.24) 0.80    4960.1   13100.00
      9     3558.85   78.76    0.836  0.30( 0.24) 0.80    6225.4   13000.00
     10     3477.98   81.20    0.822  0.30( 0.24) 0.80    6245.3   13010.00
    TOTAL AREA(ACRES) =      6245.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     4090.87  Tc(MIN.) =   50.367
  EFFECTIVE AREA(ACRES) =   4834.25  AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.75
  TOTAL AREA(ACRES) =     6245.3
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.00 =   41886.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

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 FLOW PROCESS FROM NODE  13305.00 TO NODE  13306.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    315.00  DOWNSTREAM(FEET) =    245.50
 CHANNEL LENGTH THRU SUBAREA(FEET) =  4408.41   CHANNEL SLOPE =  0.0158
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.22
 *  10 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
 PUBLIC PARK                B       68.77      0.30     0.850    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.850
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4114.29
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.00
 AVERAGE FLOW DEPTH(FEET) =   5.22   TRAVEL TIME(MIN.) =   6.12
 Tc(MIN.) =   56.49
 SUBAREA AREA(ACRES) =    68.77       SUBAREA RUNOFF(CFS) =   46.84
 EFFECTIVE AREA(ACRES) =   4903.02     AREA-AVERAGED Fm(INCH/HR) =   0.24
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
 TOTAL AREA(ACRES) =     6314.1         PEAK FLOW RATE(CFS) =    4090.87
 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) =   5.20

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  5.20   FLOW VELOCITY(FEET/SEC.) =  11.99
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13306.00 =   46294.95 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13306.00 TO NODE  13306.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   56.49
 *  10 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
 NATURAL POOR COVER
 "BARREN"                   B       21.50      0.30     1.000    86
 COMMERCIAL                 B       15.30      0.30     0.100    56
 NATURAL FAIR COVER
 "GRASS"                    B        0.80      0.30     1.000    69
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 B        0.60      0.30     1.000    65
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B        8.00      0.30     0.900    56
 NATURAL FAIR COVER
 "WOODLAND,GRASS"           B        0.10      0.30     1.000    65
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.685
 SUBAREA AREA(ACRES) =   46.30      SUBAREA RUNOFF(CFS) =   33.60
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 EFFECTIVE AREA(ACRES) =   4949.32   AREA-AVERAGED Fm(INCH/HR) =  0.24
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.80
 TOTAL AREA(ACRES) =     6360.4       PEAK FLOW RATE(CFS) =    4090.87
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE  13306.00 TO NODE  13306.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   56.49
 *  10 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
 NATURAL POOR COVER
 "BARREN"                   B       43.30      0.30     1.000    86
 COMMERCIAL                 B        4.90      0.30     0.100    56
 NATURAL FAIR COVER
 "GRASS"                    B        5.70      0.30     1.000    69
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 B        0.50      0.30     1.000    65
 PUBLIC PARK                B        1.10      0.30     0.850    56
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B        3.10      0.30     0.900    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.917
 SUBAREA AREA(ACRES) =   58.60      SUBAREA RUNOFF(CFS) =   38.86
 EFFECTIVE AREA(ACRES) =   5007.92   AREA-AVERAGED Fm(INCH/HR) =  0.24
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.80
 TOTAL AREA(ACRES) =     6419.0       PEAK FLOW RATE(CFS) =    4090.87
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE  13306.00 TO NODE  13306.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   56.49
 *  10 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
 NATURAL FAIR COVER
 "WOODLAND,GRASS"           B        6.80      0.30     1.000    65
 NATURAL POOR COVER
 "BARREN"                   B        0.70      0.30     1.000    86
 COMMERCIAL                 B        1.10      0.30     0.100    56
 NATURAL FAIR COVER
 "GRASS"                    B        0.50      0.30     1.000    69
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 B        0.10      0.30     1.000    65
 PUBLIC PARK                B        0.50      0.30     0.850    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.890
 SUBAREA AREA(ACRES) =    9.70      SUBAREA RUNOFF(CFS) =    6.50
 EFFECTIVE AREA(ACRES) =   5017.62   AREA-AVERAGED Fm(INCH/HR) =  0.24
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.80
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  TOTAL AREA(ACRES) =     6428.7       PEAK FLOW RATE(CFS) =    4090.87
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13306.00 TO NODE  13306.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   56.49                                  HZ-31116
  *  10 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
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        2.20      0.30     0.900    56
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.10      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.904
  SUBAREA AREA(ACRES) =    2.30      SUBAREA RUNOFF(CFS) =    1.53
  EFFECTIVE AREA(ACRES) =   5019.92   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.80
  TOTAL AREA(ACRES) =     6431.0       PEAK FLOW RATE(CFS) =    4090.87
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  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) =   5.14
  CHANNEL FLOW THRU SUBAREA(CFS) =    4090.87
  FLOW VELOCITY(FEET/SEC.) =  12.17   FLOW DEPTH(FEET) =   5.14
  TRAVEL TIME(MIN.) =   2.11   Tc(MIN.) =   58.60
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13307.00 =   47838.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13307.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   58.60                                  HZ-31010
  *  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
  COMMERCIAL                 B        0.20      0.30     0.100    56
  NATURAL FAIR COVER
  "GRASS"                    B        0.10      0.30     1.000    69
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        0.20      0.30     1.000    65
  NATURAL POOR COVER
  "BARREN"                   B        3.70      0.30     1.000    86
```



```
  COMMERCIAL                 B        0.30      0.30     0.100    56
  NATURAL FAIR COVER
  "GRASS"                    B        3.20      0.30     1.000    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.942
  SUBAREA AREA(ACRES) =    7.70      SUBAREA RUNOFF(CFS) =    4.91
  EFFECTIVE AREA(ACRES) =   5027.62   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.80
  TOTAL AREA(ACRES) =     6438.7       PEAK FLOW RATE(CFS) =    4090.87
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13307.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   58.60                                  HZ-31010
  *  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
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        3.60      0.30     1.000    65
  NATURAL FAIR COVER
  "GRASS"                    B        1.90      0.30     1.000    69
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.60      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =    6.10      SUBAREA RUNOFF(CFS) =    3.79
  EFFECTIVE AREA(ACRES) =   5033.72   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.80
  TOTAL AREA(ACRES) =     6444.8       PEAK FLOW RATE(CFS) =    4090.87
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  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) =   6.14
  CHANNEL FLOW THRU SUBAREA(CFS) =    4090.87
  FLOW VELOCITY(FEET/SEC.) =   9.73   FLOW DEPTH(FEET) =   6.14
  TRAVEL TIME(MIN.) =   1.59   Tc(MIN.) =   60.19
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13308.00 =   48763.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   60.19
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.976
```

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SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "GRASS"	B	0.10	0.30	1.000	69
NATURAL FAIR COVER "OPEN BRUSH"	B	0.20	0.30	1.000	66
NATURAL FAIR COVER "WOODLAND,GRASS"	B	5.00	0.30	1.000	65
COMMERCIAL	B	3.20	0.30	0.100	56
NATURAL FAIR COVER "GRASS"	B	0.10	0.30	1.000	69
NATURAL FAIR COVER "OPEN BRUSH"	B	0.90	0.30	1.000	66

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.697
SUBAREA AREA(ACRES) = 9.50 SUBAREA RUNOFF(CFS) = 6.55
EFFECTIVE AREA(ACRES) = 5043.22 AREA-AVERAGED Fm(INCH/HR) = 0.24
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.80
TOTAL AREA(ACRES) = 6454.3 PEAK FLOW RATE(CFS) = 4090.87
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 60.19
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.976

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SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
APARTMENTS	B	0.30	0.30	0.200	56
NATURAL POOR COVER "BARREN"	B	0.20	0.30	1.000	86
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	B	1.00	0.30	1.000	63
COMMERCIAL	B	41.90	0.30	0.100	56
NATURAL FAIR COVER "GRASS"	B	7.20	0.30	1.000	69
NATURAL FAIR COVER "OPEN BRUSH"	B	25.00	0.30	1.000	66

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.498
SUBAREA AREA(ACRES) = 75.60 SUBAREA RUNOFF(CFS) = 56.22
EFFECTIVE AREA(ACRES) = 5118.82 AREA-AVERAGED Fm(INCH/HR) = 0.24
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.79
TOTAL AREA(ACRES) = 6529.9 PEAK FLOW RATE(CFS) = 4090.87
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 60.19
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.976
SUBAREA LOSS RATE DATA(AMC II):

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DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	B	0.10	0.30	0.850	56
AGRICULTURAL POOR COVER "ROW CROPS,CONTOURED"	B	0.90	0.30	1.000	79
SCHOOL	B	0.30	0.30	0.600	56
NATURAL FAIR COVER "WOODLAND,GRASS"	B	13.20	0.30	1.000	65
APARTMENTS	B	0.50	0.30	0.200	56
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	B	0.60	0.30	1.000	63

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.966
SUBAREA AREA(ACRES) = 15.60 SUBAREA RUNOFF(CFS) = 9.63
EFFECTIVE AREA(ACRES) = 5134.42 AREA-AVERAGED Fm(INCH/HR) = 0.24
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.79
TOTAL AREA(ACRES) = 6545.5 PEAK FLOW RATE(CFS) = 4090.87
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 60.19
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.976

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SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	33.90	0.30	0.100	56
NATURAL FAIR COVER "GRASS"	B	17.60	0.30	1.000	69
NATURAL FAIR COVER "OPEN BRUSH"	B	16.80	0.30	1.000	66
RESIDENTIAL "11+ DWELLINGS/ACRE"	B	0.60	0.30	0.200	56
RESIDENTIAL "8-10 DWELLINGS/ACRE"	B	1.50	0.30	0.400	56
AGRICULTURAL POOR COVER "ROW CROPS,CONTOURED"	B	10.00	0.30	1.000	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.603
SUBAREA AREA(ACRES) = 80.40 SUBAREA RUNOFF(CFS) = 57.51
EFFECTIVE AREA(ACRES) = 5214.82 AREA-AVERAGED Fm(INCH/HR) = 0.24
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.79
TOTAL AREA(ACRES) = 6625.9 PEAK FLOW RATE(CFS) = 4090.87
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 60.19
* 10 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

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```
  SCHOOL                    B        0.30      0.30     0.600    56
  NATURAL FAIR COVER
  "WOODLAND,GRASS"          B        0.70      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.880
  SUBAREA AREA(ACRES) =    1.00      SUBAREA RUNOFF(CFS) =    0.64
  EFFECTIVE AREA(ACRES) =   5215.82   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.79
  TOTAL AREA(ACRES) =     6626.9       PEAK FLOW RATE(CFS) =    4090.87
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   60.19
  *  10 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
  NATURAL FAIR COVER
  "GRASS"                   B        0.30      0.30     1.000    69
  NATURAL FAIR COVER
  "WOODLAND,GRASS"          B        0.80      0.30     1.000    65
  NATURAL FAIR COVER
  "GRASS"                   B        0.50      0.30     1.000    69
  NATURAL FAIR COVER
  "WOODLAND,GRASS"          B        0.20      0.30     1.000    65
  NATURAL FAIR COVER
  "GRASS"                   B        0.30      0.30     1.000    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =    2.10      SUBAREA RUNOFF(CFS) =    1.28
  EFFECTIVE AREA(ACRES) =   5217.92   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.79
  TOTAL AREA(ACRES) =     6629.0       PEAK FLOW RATE(CFS) =    4090.87
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   60.19
  *  10 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
  NATURAL FAIR COVER
  "GRASS"                   B        1.20      0.30     1.000    69
  NATURAL FAIR COVER
  "OPEN BRUSH"              B        0.50      0.30     1.000    66
  PUBLIC PARK               B        1.70      0.30     0.850    56
  NATURAL FAIR COVER
  "WOODLAND,GRASS"          B        7.20      0.30     1.000    65
  NATURAL FAIR COVER
  "GRASS"                   B        1.00      0.30     1.000    69
```

HZ-31010.2

HZ-31113.2


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  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.978
  SUBAREA AREA(ACRES) =   11.60      SUBAREA RUNOFF(CFS) =    7.12
  EFFECTIVE AREA(ACRES) =   5229.52   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.79
  TOTAL AREA(ACRES) =     6640.6       PEAK FLOW RATE(CFS) =    4090.87
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =     6640.6  TC(MIN.) =     60.19
  EFFECTIVE AREA(ACRES) =   5229.52  AREA-AVERAGED Fm(INCH/HR)=  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.791
  PEAK FLOW RATE(CFS)   =    4090.87

  ** PEAK FLOW RATE TABLE **
   STREAM       Q       Tc    Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1     3178.56   24.58    1.630  0.30( 0.22) 0.73    1946.7     120.00
      2     3188.93   24.76    1.623  0.30( 0.22) 0.73    1964.9     110.00
      3     3455.52   31.56    1.412  0.30( 0.23) 0.75    2595.9     100.00
      4     3519.57   34.28    1.347  0.30( 0.23) 0.76    2824.1     150.00
      5     3723.83   45.43    1.146  0.30( 0.23) 0.78    3728.7   31100.00
      6     4087.10   59.93    0.978  0.30( 0.24) 0.79    5205.5   13210.00
      7     4090.87   60.19    0.976  0.30( 0.24) 0.79    5229.5   13200.00
      8     4073.32   62.01    0.959  0.30( 0.24) 0.79    5355.4   13100.00
      9     3558.85   89.02    0.780  0.30( 0.24) 0.79    6620.6   13000.00
     10     3477.98   91.53    0.767  0.30( 0.24) 0.79    6640.6   13010.00
============================================================================
============================================================================
  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:




 ************************ DESCRIPTION OF STUDY *************************
* GOBERNADORA WATERSHED STUDY - RATIONAL METHOD                        *
* LOCAL WATERSHED S33- FREE DRAINING - ULTIMATE CONDITION              *
* 50-YR EV AUGUST 2018 ROKAMOTO                                       *
 ***********************************************************************

  FILE NAME: RU50EV33.DAT
  TIME/DATE OF STUDY: 14:14 08/29/2018
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   15.00
  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;  3.010
   3)   15.00;  2.390
   4)   20.00;  2.030
   5)   25.00;  1.790
   6)   30.00;  1.600
   7)   40.00;  1.370
   8)   50.00;  1.200
   9)   60.00;  1.060
  10)   90.00;  0.860
  11)  120.00;  0.730
  12)  180.00;  0.590
  13)  360.00;  0.410
  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 0.0313 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)
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    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: S31X50.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     2838.09   34.69  0.30( 0.24) 0.81    2526.1   13100.00
      2     2813.56   59.31  0.30( 0.24) 0.81    3777.1   13000.00
      3     2759.78   61.54  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: S32X50.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1294.02   32.85  0.30( 0.25) 0.83    1118.5   13210.00
      2     1295.27   33.25  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     1294.02   32.85  0.30( 0.25) 0.83    1118.5   13210.00
      2     1295.27   33.25  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     1294.02   32.85    1.534  0.30( 0.25) 0.83    1118.5   13210.00
      2     1295.27   33.25    1.525  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     2838.09   34.69     1.492  0.30( 0.24) 0.81    2526.1   13100.00
     2     2813.56   59.31     1.070  0.30( 0.24) 0.81    3777.1   13000.00
     3     2759.78   61.54     1.050  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     4072.82   32.85     1.534  0.30( 0.24) 0.82    3511.0   13210.00
     2     4087.83   33.25     1.525  0.30( 0.24) 0.82    3549.2   13200.00
     3     4099.88   34.69     1.492  0.30( 0.24) 0.82    3653.7   13100.00
     4     3646.75   59.31     1.070  0.30( 0.24) 0.81    4904.7   13000.00
     5     3572.79   61.54     1.050  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) =     4099.88  Tc(MIN.) =   34.689
 EFFECTIVE AREA(ACRES) =   3653.73  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  13222.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13222.00 TO NODE  13222.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  13222.00 TO NODE  13301.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    427.51  DOWNSTREAM(FEET) =    382.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2533.33   CHANNEL SLOPE =  0.0180
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   5.04
 *  15 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
 COMMERCIAL                 B        1.40      0.30     0.100    56
 NATURAL FAIR COVER
 "OPEN BRUSH"               B       15.60      0.30     1.000    66
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.10      0.30     0.600    56
 AGRICULTURAL POOR COVER
```



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 "ROW CROPS,CONTOURED"      B        5.30      0.30     1.000    79
 NATURAL POOR COVER
 "BARREN"                   B        0.20      0.30     1.000    86
 COMMERCIAL                 B       22.60      0.30     0.100    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.521
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4125.48
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.57
 AVERAGE FLOW DEPTH(FEET) =   5.04   TRAVEL TIME(MIN.) =   3.36
 Tc(MIN.) =   38.05
 SUBAREA AREA(ACRES) =    45.20       SUBAREA RUNOFF(CFS) =   51.20
 EFFECTIVE AREA(ACRES) =   3698.93     AREA-AVERAGED Fm(INCH/HR) =   0.24
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
 TOTAL AREA(ACRES) =     4969.6         PEAK FLOW RATE(CFS) =    4099.88
 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) =   5.02

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  5.02   FLOW VELOCITY(FEET/SEC.) =  12.54
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13301.00 =   34659.82 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   38.05
 *  15 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
 AGRICULTURAL POOR COVER
 "ROW CROPS,CONTOURED"      B        1.00      0.30     1.000    79
 NATURAL POOR COVER
 "BARREN"                   B        0.50      0.30     1.000    86
 COMMERCIAL                 B        7.40      0.30     0.100    56
 AGRICULTURAL POOR COVER
 "ROW CROPS,CONTOURED"      B        4.70      0.30     1.000    79
 NATURAL FAIR COVER
 "WOODLAND,GRASS"           B        2.90      0.30     1.000    65
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.596
 SUBAREA AREA(ACRES) =   16.50      SUBAREA RUNOFF(CFS) =   18.35
 EFFECTIVE AREA(ACRES) =   3715.43   AREA-AVERAGED Fm(INCH/HR) =  0.24
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.81
 TOTAL AREA(ACRES) =     4986.1       PEAK FLOW RATE(CFS) =    4099.88
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   38.05
 *  15 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
 NATURAL POOR COVER
 "BARREN"                   B        1.30      0.30     1.000    86
 COMMERCIAL                 B        0.20      0.30     0.100    56
 AGRICULTURAL POOR COVER
 "ROW CROPS,CONTOURED"      B        5.30      0.30     1.000    79
 NATURAL FAIR COVER
 "WOODLAND,GRASS"           B        0.30      0.30     1.000    65
 NATURAL FAIR COVER
 "CHAPARRAL,BROADLEAF"      B        0.20      0.30     1.000    63
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        0.60      0.30     1.000    66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.977
 SUBAREA AREA(ACRES) =    7.90      SUBAREA RUNOFF(CFS) =    7.98
 EFFECTIVE AREA(ACRES) =   3723.33   AREA-AVERAGED Fm(INCH/HR) =  0.24
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.81
 TOTAL AREA(ACRES) =     4994.0       PEAK FLOW RATE(CFS) =    4099.88
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   38.05
 *  15 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
 AGRICULTURAL POOR COVER
 "ROW CROPS,CONTOURED"      B        4.30      0.30     1.000    79
 NATURAL FAIR COVER
 "WOODLAND,GRASS"           B        0.80      0.30     1.000    65
 NATURAL FAIR COVER
 "CHAPARRAL,BROADLEAF"      B        1.10      0.30     1.000    63
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        6.90      0.30     1.000    66
 AGRICULTURAL POOR COVER
 "ROW CROPS,CONTOURED"      B        7.90      0.30     1.000    79
 NATURAL FAIR COVER
 "WOODLAND,GRASS"           B        1.00      0.30     1.000    65
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA AREA(ACRES) =   22.00      SUBAREA RUNOFF(CFS) =   22.08
 EFFECTIVE AREA(ACRES) =   3745.33   AREA-AVERAGED Fm(INCH/HR) =  0.24
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.81
 TOTAL AREA(ACRES) =     5016.0       PEAK FLOW RATE(CFS) =    4099.88
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   38.05
 *  15 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
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        0.40      0.30     1.000    66
 AGRICULTURAL POOR COVER
 "ROW CROPS,CONTOURED"      B       14.60      0.30     1.000    79
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA AREA(ACRES) =   15.00      SUBAREA RUNOFF(CFS) =   15.05
 EFFECTIVE AREA(ACRES) =   3760.33   AREA-AVERAGED Fm(INCH/HR) =  0.24
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.81
 TOTAL AREA(ACRES) =     5031.0       PEAK FLOW RATE(CFS) =    4099.88
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  31100.00 TO NODE  31101.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   317.00
 ELEVATION DATA: UPSTREAM(FEET) =    801.00  DOWNSTREAM(FEET) =    685.00

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.641
 *  15 YEAR RAINFALL INTENSITY(INCH/HR) =  3.399
 SUBAREA Tc AND LOSS RATE 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"      B        0.50      0.30     1.000    63    8.64
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        0.30      0.30     1.000    66    8.64
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        0.30      0.30     1.000    66    8.64
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =      3.07
 TOTAL AREA(ACRES) =      1.10   PEAK FLOW RATE(CFS) =      3.07

****************************************************************************
 FLOW PROCESS FROM NODE  31101.00 TO NODE  31102.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    685.00  DOWNSTREAM(FEET) =    655.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   135.00   CHANNEL SLOPE =  0.2222
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
 MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
 *  15 YEAR RAINFALL INTENSITY(INCH/HR) =  3.301
```

```
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.50      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.10      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.70      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.62
  AVERAGE FLOW DEPTH(FEET) =   0.49   TRAVEL TIME(MIN.) =   0.34
  Tc(MIN.) =    8.98
  SUBAREA AREA(ACRES) =     1.30       SUBAREA RUNOFF(CFS) =    3.51
  EFFECTIVE AREA(ACRES) =      2.40     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        2.4         PEAK FLOW RATE(CFS) =       6.48

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.55   FLOW VELOCITY(FEET/SEC.) =   7.09
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31102.00 =     452.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31102.00 TO NODE  31103.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    655.00  DOWNSTREAM(FEET) =    630.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   203.00   CHANNEL SLOPE =  0.1232
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  15 YEAR RAINFALL INTENSITY(INCH/HR) =  3.148
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.30      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.10      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        1.90      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.29
  AVERAGE FLOW DEPTH(FEET) =   0.71   TRAVEL TIME(MIN.) =   0.54
  Tc(MIN.) =    9.52
  SUBAREA AREA(ACRES) =     2.30       SUBAREA RUNOFF(CFS) =    5.89
  EFFECTIVE AREA(ACRES) =      4.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        4.7         PEAK FLOW RATE(CFS) =      12.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.78   FLOW VELOCITY(FEET/SEC.) =   6.68
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31103.00 =     655.00 FEET.
```



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****************************************************************************
  FLOW PROCESS FROM NODE  31103.00 TO NODE  31104.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    630.00  DOWNSTREAM(FEET) =    605.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   321.00   CHANNEL SLOPE =  0.0779
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  15 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
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        1.10      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.50      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.06
  AVERAGE FLOW DEPTH(FEET) =   0.95   TRAVEL TIME(MIN.) =   0.88
  Tc(MIN.) =   10.40
  SUBAREA AREA(ACRES) =     3.60       SUBAREA RUNOFF(CFS) =    8.62
  EFFECTIVE AREA(ACRES) =      8.30     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        8.3         PEAK FLOW RATE(CFS) =      19.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.02   FLOW VELOCITY(FEET/SEC.) =   6.37
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31104.00 =     976.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31104.00 TO NODE  31105.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    605.00  DOWNSTREAM(FEET) =    585.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   288.00   CHANNEL SLOPE =  0.0694
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  15 YEAR RAINFALL INTENSITY(INCH/HR) =  2.870
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.70      0.30     1.000    63
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.60      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        3.00      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.10      0.30     1.000    66
  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) =      27.27
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.62
  AVERAGE FLOW DEPTH(FEET) =   1.17   TRAVEL TIME(MIN.) =   0.73
  Tc(MIN.) =   11.13
  SUBAREA AREA(ACRES) =     6.40       SUBAREA RUNOFF(CFS) =   14.80
  EFFECTIVE AREA(ACRES) =     14.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       14.7         PEAK FLOW RATE(CFS) =      34.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.27   FLOW VELOCITY(FEET/SEC.) =   7.01
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31105.00 =    1264.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31105.00 TO NODE  31106.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    585.00  DOWNSTREAM(FEET) =    560.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   344.00   CHANNEL SLOPE =  0.0727
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  15 YEAR RAINFALL INTENSITY(INCH/HR) =  2.778
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.60      0.30     1.000    63
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        2.80      0.30     1.000    63
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.60      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.10      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.60      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        4.10      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      46.04
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.67
  AVERAGE FLOW DEPTH(FEET) =   1.41   TRAVEL TIME(MIN.) =   0.75
  Tc(MIN.) =   11.87
  SUBAREA AREA(ACRES) =    10.80       SUBAREA RUNOFF(CFS) =   24.08
  EFFECTIVE AREA(ACRES) =     25.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       25.5         PEAK FLOW RATE(CFS) =      56.86

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.53   FLOW VELOCITY(FEET/SEC.) =   8.09
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31106.00 =    1608.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31106.00 TO NODE  31107.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```



```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    560.00  DOWNSTREAM(FEET) =    530.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   619.00   CHANNEL SLOPE =  0.0485
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  15 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
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.80      0.30     1.000    63
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        1.90      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        1.50      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        8.20      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.70      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      72.52
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.37
  AVERAGE FLOW DEPTH(FEET) =   1.81   TRAVEL TIME(MIN.) =   1.40
  Tc(MIN.) =   13.27
  SUBAREA AREA(ACRES) =    15.10       SUBAREA RUNOFF(CFS) =   31.31
  EFFECTIVE AREA(ACRES) =     40.60     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.6         PEAK FLOW RATE(CFS) =      84.19

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.91   FLOW VELOCITY(FEET/SEC.) =   7.68
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31107.00 =    2227.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31107.00 TO NODE  31108.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    530.00  DOWNSTREAM(FEET) =    515.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   377.00   CHANNEL SLOPE =  0.0398
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  15 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
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.50      0.30     1.000    63
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        6.50      0.30     1.000    63
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        1.30      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        1.10      0.30     1.000    66
  NATURAL FAIR COVER
```

```
  "OPEN BRUSH"                B        5.50      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"                B        3.40      0.30     1.000    66
  SUBAREA 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.) =   7.49
  AVERAGE FLOW DEPTH(FEET) =   2.13   TRAVEL TIME(MIN.) =   0.84
  Tc(MIN.) =   14.11
  SUBAREA AREA(ACRES) =    18.30       SUBAREA RUNOFF(CFS) =   36.23
  EFFECTIVE AREA(ACRES) =     58.90     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       58.9         PEAK FLOW RATE(CFS) =     116.62

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.25   FLOW VELOCITY(FEET/SEC.) =   7.71
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31108.00 =    2604.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31108.00 TO NODE  31109.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    515.00  DOWNSTREAM(FEET) =    490.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   520.00   CHANNEL SLOPE =  0.0481
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  15 YEAR RAINFALL INTENSITY(INCH/HR) =  2.381
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       B        0.70      0.30     1.000    63
  NATURAL FAIR COVER
  "GRASS"                     B        2.20      0.30     1.000    69
  NATURAL FAIR COVER
  "OPEN BRUSH"                B        3.10      0.30     1.000    66
  NATURAL FAIR COVER
  "WOODLAND,GRASS"            B        0.90      0.30     1.000    65
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       B        7.40      0.30     1.000    63
  NATURAL FAIR COVER
  "GRASS"                     B        0.30      0.30     1.000    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     130.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.54
  AVERAGE FLOW DEPTH(FEET) =   2.26   TRAVEL TIME(MIN.) =   1.02
  Tc(MIN.) =   15.13
  SUBAREA AREA(ACRES) =    14.60       SUBAREA RUNOFF(CFS) =   27.34
  EFFECTIVE AREA(ACRES) =     73.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       73.5         PEAK FLOW RATE(CFS) =     137.65

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.30   FLOW VELOCITY(FEET/SEC.) =   8.66
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31109.00 =    3124.00 FEET.
```



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****************************************************************************
  FLOW PROCESS FROM NODE  31109.00 TO NODE  31109.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   15.13
  *  15 YEAR RAINFALL INTENSITY(INCH/HR) =  2.381
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                B       11.40      0.30     1.000    66
  NATURAL FAIR COVER
  "WOODLAND,GRASS"            B        8.90      0.30     1.000    65
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       B        1.90      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"                B        9.20      0.30     1.000    66
  NATURAL FAIR COVER
  "WOODLAND,GRASS"            B        1.40      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   32.80      SUBAREA RUNOFF(CFS) =   61.43
  EFFECTIVE AREA(ACRES) =    106.30   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =      106.3       PEAK FLOW RATE(CFS) =     199.07

****************************************************************************
  FLOW PROCESS FROM NODE  31109.00 TO NODE  31110.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    490.00  DOWNSTREAM(FEET) =    432.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1420.00   CHANNEL SLOPE =  0.0408
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  15 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
  NATURAL FAIR COVER
  "GRASS"                     B        0.80      0.30     1.000    69
  NATURAL FAIR COVER
  "OPEN BRUSH"                B        0.60      0.30     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"          B        0.10      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        1.30      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"            B        4.00      0.30     1.000    65
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"       B        1.50      0.30     1.000    63
  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) =     206.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.99
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  AVERAGE FLOW DEPTH(FEET) =   2.76   TRAVEL TIME(MIN.) =   2.63
  Tc(MIN.) =   17.76
  SUBAREA AREA(ACRES) =     8.30       SUBAREA RUNOFF(CFS) =   14.13
  EFFECTIVE AREA(ACRES) =    114.60     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      114.6         PEAK FLOW RATE(CFS) =     199.07
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.73   FLOW VELOCITY(FEET/SEC.) =   8.91
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31110.00 =    4544.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31110.00 TO NODE  31110.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   17.76
  *  15 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
  NATURAL FAIR COVER
  "GRASS"                    B        0.30      0.30     1.000    69
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        9.60      0.30     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.40      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        6.20      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        3.90      0.30     1.000    65
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        1.40      0.30     1.000    79
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.998
  SUBAREA AREA(ACRES) =   21.80      SUBAREA RUNOFF(CFS) =   37.12
  EFFECTIVE AREA(ACRES) =    136.40   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =      136.4       PEAK FLOW RATE(CFS) =     232.18

****************************************************************************
  FLOW PROCESS FROM NODE  31110.00 TO NODE  13301.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    432.00  DOWNSTREAM(FEET) =    382.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1847.00   CHANNEL SLOPE =  0.0271
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  15 YEAR RAINFALL INTENSITY(INCH/HR) =  1.954
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL POOR COVER
  "BARREN"                   B        4.90      0.30     1.000    86
  AGRICULTURAL POOR COVER
```



```
  "ROW CROPS,CONTOURED"      B        1.50      0.30     1.000    79
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.60      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        2.50      0.30     1.000    79
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        5.30      0.30     1.000    79
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        3.30      0.30     1.000    79
  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) =     245.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.07
  AVERAGE FLOW DEPTH(FEET) =   3.19   TRAVEL TIME(MIN.) =   3.82
  Tc(MIN.) =   21.58
  SUBAREA AREA(ACRES) =    18.10       SUBAREA RUNOFF(CFS) =   26.97
  EFFECTIVE AREA(ACRES) =    154.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      154.5         PEAK FLOW RATE(CFS) =     232.18
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.12   FLOW VELOCITY(FEET/SEC.) =   7.93
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  13301.00 =    6391.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 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      232.18   21.58    1.954  0.30( 0.30) 1.00     154.5   31100.00
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  13301.00 =    6391.00 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     4072.82   36.22    1.457  0.30( 0.24) 0.81    3617.6   13210.00
      2     4087.83   36.62    1.448  0.30( 0.24) 0.81    3655.8   13200.00
      3     4099.88   38.05    1.415  0.30( 0.24) 0.81    3760.3   13100.00
      4     3646.75   62.80    1.041  0.30( 0.24) 0.81    5011.3   13000.00
      5     3572.79   65.05    1.026  0.30( 0.24) 0.81    5031.0   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13301.00 =   34659.82 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     3653.17   21.58    1.954  0.30( 0.25) 0.83    2309.5   31100.00
      2     4235.21   36.22    1.457  0.30( 0.25) 0.82    3772.1   13210.00
      3     4248.94   36.62    1.448  0.30( 0.25) 0.82    3810.3   13200.00
      4     4256.36   38.05    1.415  0.30( 0.25) 0.82    3914.8   13100.00
      5     3750.81   62.80    1.041  0.30( 0.24) 0.82    5165.8   13000.00
      6     3674.75   65.05    1.026  0.30( 0.24) 0.82    5185.5   13010.00
    TOTAL AREA(ACRES) =      5185.5
```

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  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     4256.36  Tc(MIN.) =   38.048
  EFFECTIVE AREA(ACRES) =   3914.83  AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     5185.5
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13301.00 =   34659.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  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) =   6.89
  *  15 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
  NATURAL FAIR COVER
  "GRASS"                     B        9.42      0.30     1.000    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4260.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.74
  AVERAGE FLOW DEPTH(FEET) =   6.89   TRAVEL TIME(MIN.) =   2.17
  Tc(MIN.) =   40.22
  SUBAREA AREA(ACRES) =     9.42       SUBAREA RUNOFF(CFS) =    9.04
  EFFECTIVE AREA(ACRES) =   3924.25     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.82
  TOTAL AREA(ACRES) =     5194.9         PEAK FLOW RATE(CFS) =    4256.36
  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 = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   6.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.89   FLOW VELOCITY(FEET/SEC.) =   8.74
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13302.00 =   35800.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13302.00 TO NODE  13302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   40.22
  *  15 YEAR RAINFALL INTENSITY(INCH/HR) =  1.366
  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
  NATURAL POOR COVER
  "BARREN"                    B       13.80      0.30     1.000    86
  NATURAL POOR COVER
  "BARREN"                    B        2.60      0.30     1.000    86
  COMMERCIAL                  B        1.10      0.30     0.100    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"          B        3.50      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        6.90      0.30     1.000    79
  NATURAL POOR COVER
  "BARREN"                    B        0.20      0.30     1.000    86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.952
  SUBAREA AREA(ACRES) =   28.10      SUBAREA RUNOFF(CFS) =   27.33
  EFFECTIVE AREA(ACRES) =   3952.35   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     5223.0       PEAK FLOW RATE(CFS) =    4256.36
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13302.00 TO NODE  13302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   40.22
  *  15 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
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        0.10      0.30     1.000    79
  COMMERCIAL                  B        0.10      0.30     0.100    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"          B        2.40      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        0.50      0.30     1.000    79
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.894
  SUBAREA AREA(ACRES) =    3.10      SUBAREA RUNOFF(CFS) =    3.06
  EFFECTIVE AREA(ACRES) =   3955.45   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     5226.1       PEAK FLOW RATE(CFS) =    4256.36
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13302.00 TO NODE  13302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   40.22
  *  15 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
  NATURAL POOR COVER
  "BARREN"                    B        0.10      0.30     1.000    86
  NATURAL FAIR COVER
```

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  "OPEN BRUSH"               B        2.60      0.30     1.000    66
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        3.10      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.40      0.30     1.000    65
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.20      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       13.80      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   20.20      SUBAREA RUNOFF(CFS) =   19.38
  EFFECTIVE AREA(ACRES) =   3975.65   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     5246.4       PEAK FLOW RATE(CFS) =    4256.36
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13302.00 TO NODE  13302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   40.22
  *  15 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
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B       34.60      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        2.40      0.30     1.000    65
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       22.60      0.30     1.000    66
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B       11.60      0.30     1.000    79
  APARTMENTS                 B        0.40      0.30     0.200    56
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        4.80      0.30     1.000    63
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.996
  SUBAREA AREA(ACRES) =   76.40      SUBAREA RUNOFF(CFS) =   73.40
  EFFECTIVE AREA(ACRES) =   4052.05   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5322.8       PEAK FLOW RATE(CFS) =    4256.36
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13302.00 TO NODE  13302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   40.22
  *  15 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
  NATURAL FAIR COVER
  "GRASS"                    B        1.60      0.30     1.000    69
```



```
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       46.40      0.30     1.000    66
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        0.10      0.30     0.200    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B       60.70      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        5.80      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.999
  SUBAREA AREA(ACRES) =  114.60      SUBAREA RUNOFF(CFS) =  109.99
  EFFECTIVE AREA(ACRES) =   4166.65   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5437.4       PEAK FLOW RATE(CFS) =    4256.36
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  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) =   6.18
  CHANNEL FLOW THRU SUBAREA(CFS) =    4256.36
  FLOW VELOCITY(FEET/SEC.) =  10.04   FLOW DEPTH(FEET) =   6.18
  TRAVEL TIME(MIN.) =   3.64   Tc(MIN.) =   43.87
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13303.00 =   37994.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   43.87
  *  15 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
  NATURAL POOR COVER
  "BARREN"                   B        0.20      0.30     1.000    86
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.40      0.30     1.000    65
  NATURAL POOR COVER
  "BARREN"                   B        0.80      0.30     1.000    86
  COMMERCIAL                 B        1.40      0.30     0.100    56
  NATURAL FAIR COVER
  "GRASS"                    B        2.60      0.30     1.000    69
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.20      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.834
  SUBAREA AREA(ACRES) =    7.60      SUBAREA RUNOFF(CFS) =    7.21
  EFFECTIVE AREA(ACRES) =   4174.25   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
```

```
  TOTAL AREA(ACRES) =     5445.0       PEAK FLOW RATE(CFS) =    4256.36
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   43.87
  *  15 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
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        3.10      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        3.40      0.30     1.000    65
  NATURAL POOR COVER
  "BARREN"                   B        0.50      0.30     1.000    86
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.20      0.30     1.000    63
  COMMERCIAL                 B        3.60      0.30     0.100    56
  NATURAL FAIR COVER
  "GRASS"                    B        4.00      0.30     1.000    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.781
  SUBAREA AREA(ACRES) =   14.80      SUBAREA RUNOFF(CFS) =   14.25
  EFFECTIVE AREA(ACRES) =   4189.05   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5459.8       PEAK FLOW RATE(CFS) =    4256.36
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   43.87
  *  15 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
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       14.60      0.30     1.000    66
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        6.30      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        3.70      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   24.60      SUBAREA RUNOFF(CFS) =   22.24
  EFFECTIVE AREA(ACRES) =   4213.65   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5484.4       PEAK FLOW RATE(CFS) =    4256.36
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
```



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----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   43.87
  *  15 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
  NATURAL POOR COVER
  "BARREN"                   B        0.50      0.30     1.000    86
  COMMERCIAL                 B        0.30      0.30     0.100    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.20      0.30     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.80      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        1.60      0.30     1.000    79
  NATURAL POOR COVER
  "BARREN"                   B       31.90      0.30     1.000    86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.990
  SUBAREA AREA(ACRES) =   35.30      SUBAREA RUNOFF(CFS) =   32.00
  EFFECTIVE AREA(ACRES) =   4248.95   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5519.6       PEAK FLOW RATE(CFS) =    4256.36
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   43.87
  *  15 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
  COMMERCIAL                 B        1.70      0.30     0.100    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.30      0.30     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        2.60      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        5.50      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.20      0.30     1.000    65
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.20      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.830
  SUBAREA AREA(ACRES) =   10.50      SUBAREA RUNOFF(CFS) =    9.97
  EFFECTIVE AREA(ACRES) =   4259.45   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5530.1       PEAK FLOW RATE(CFS) =    4256.36
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
```

```
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   43.87
  *  15 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
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        1.30      0.30     0.900    56
  NATURAL POOR COVER
  "BARREN"                   B        0.30      0.30     1.000    86
  COMMERCIAL                 B        0.20      0.30     0.100    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.30      0.30     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        6.50      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        3.00      0.30     1.000    79
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.917
  SUBAREA AREA(ACRES) =   11.60      SUBAREA RUNOFF(CFS) =   10.74
  EFFECTIVE AREA(ACRES) =   4271.05   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5541.8       PEAK FLOW RATE(CFS) =    4256.36
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  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) =   7.14
  *  15 YEAR RAINFALL INTENSITY(INCH/HR) =  1.273
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                B       13.84      0.30     0.850    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.850
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4262.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.36
  AVERAGE FLOW DEPTH(FEET) =   7.14   TRAVEL TIME(MIN.) =   1.84
  Tc(MIN.) =   45.71
  SUBAREA AREA(ACRES) =    13.84       SUBAREA RUNOFF(CFS) =   12.68
  EFFECTIVE AREA(ACRES) =   4284.89     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.83
  TOTAL AREA(ACRES) =     5555.6         PEAK FLOW RATE(CFS) =    4256.36
  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 = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   7.13
```



```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.13   FLOW VELOCITY(FEET/SEC.) =   8.36
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13304.00 =   38920.27 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13304.00 TO NODE  13304.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   45.71
  *  15 YEAR RAINFALL INTENSITY(INCH/HR) =  1.273
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL POOR COVER
  "BARREN"                   B        7.80      0.30     1.000    86
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        1.70      0.30     1.000    79
  NATURAL POOR COVER
  "BARREN"                   B        9.40      0.30     1.000    86
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        1.20      0.30     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.10      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        2.60      0.30     1.000    79
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   22.80      SUBAREA RUNOFF(CFS) =   19.97
  EFFECTIVE AREA(ACRES) =   4307.69   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5578.4       PEAK FLOW RATE(CFS) =    4256.36
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13304.00 TO NODE  13304.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   45.71
  *  15 YEAR RAINFALL INTENSITY(INCH/HR) =  1.273
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.20      0.30     1.000    65
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.30      0.30     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.20      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        2.70      0.30     1.000    79
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.994
  SUBAREA AREA(ACRES) =    3.40      SUBAREA RUNOFF(CFS) =    2.98
  EFFECTIVE AREA(ACRES) =   4311.09   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5581.8       PEAK FLOW RATE(CFS) =    4256.36
```

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

****************************************************************************
  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) =   5.77
  *  15 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
  NATURAL FAIR COVER
  "GRASS"                    B       27.39      0.30     1.000    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4267.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.99
  AVERAGE FLOW DEPTH(FEET) =   5.77   TRAVEL TIME(MIN.) =   4.50
  Tc(MIN.) =   50.21
  SUBAREA AREA(ACRES) =    27.39       SUBAREA RUNOFF(CFS) =   22.11
  EFFECTIVE AREA(ACRES) =   4338.48     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.84
  TOTAL AREA(ACRES) =     5609.2         PEAK FLOW RATE(CFS) =    4256.36
  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 = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.76

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.76   FLOW VELOCITY(FEET/SEC.) =  10.98
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.00 =   41886.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   50.21
  *  15 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
  NATURAL POOR COVER
  "BARREN"                   B       18.40      0.30     1.000    86
  NATURAL FAIR COVER
  "MEADOWS"                  B        1.20      0.30     1.000    70
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.10      0.30     1.000    65
  NATURAL POOR COVER
  "BARREN"                   B       26.60      0.30     1.000    86
  COMMERCIAL                 B        3.90      0.30     0.100    56
  AGRICULTURAL POOR COVER
```



```
  "FALLOW"                   B        3.00      0.30     1.000    86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.934
  SUBAREA AREA(ACRES) =   53.20      SUBAREA RUNOFF(CFS) =   43.90
  EFFECTIVE AREA(ACRES) =   4391.68   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =     5662.4       PEAK FLOW RATE(CFS) =    4256.36
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   50.21
  *  15 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
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        1.10      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.20      0.30     1.000    65
  NATURAL POOR COVER
  "BARREN"                   B       14.00      0.30     1.000    86
  COMMERCIAL                 B        4.30      0.30     0.100    56
  AGRICULTURAL POOR COVER
  "FALLOW"                   B        5.30      0.30     1.000    86
  NATURAL FAIR COVER
  "GRASS"                    B        2.70      0.30     1.000    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.860
  SUBAREA AREA(ACRES) =   27.60      SUBAREA RUNOFF(CFS) =   23.33
  EFFECTIVE AREA(ACRES) =   4419.28   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =     5690.0       PEAK FLOW RATE(CFS) =    4256.36
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   50.21
  *  15 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
  NATURAL FAIR COVER
  "MEADOWS"                  B        3.20      0.30     1.000    70
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        6.10      0.30     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        7.50      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        5.40      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        1.60      0.30     1.000    65
```

```
  NATURAL POOR COVER
  "BARREN"                  B        1.90      0.30     1.000    86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.971
  SUBAREA AREA(ACRES) =   25.70      SUBAREA RUNOFF(CFS) =   20.95
  EFFECTIVE AREA(ACRES) =   4444.98   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =     5715.7       PEAK FLOW RATE(CFS) =    4256.36
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   50.21
  *  15 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
  COMMERCIAL                  B        2.00      0.30     0.100    56
  AGRICULTURAL POOR COVER
  "FALLOW"                    B        3.70      0.30     1.000    86
  NATURAL FAIR COVER
  "OPEN BRUSH"                B        2.10      0.30     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"          B        2.60      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        0.20      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"            B        0.10      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.807
  SUBAREA AREA(ACRES) =   10.70      SUBAREA RUNOFF(CFS) =    9.19
  EFFECTIVE AREA(ACRES) =   4455.68   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =     5726.4       PEAK FLOW RATE(CFS) =    4256.36
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   50.21
  *  15 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
  NATURAL FAIR COVER
  "OPEN BRUSH"                B        0.50      0.30     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"          B        8.20      0.30     0.900    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.906
  SUBAREA AREA(ACRES) =    8.70      SUBAREA RUNOFF(CFS) =    7.25
  EFFECTIVE AREA(ACRES) =   4464.38   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
```



```
  TOTAL AREA(ACRES) =     5735.1       PEAK FLOW RATE(CFS) =    4256.36
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 3A50EV.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)           (ACRES)    NODE
      1      949.30   13.75  0.30( 0.13) 0.43     435.3     120.00
      2      948.59   13.87  0.30( 0.13) 0.43     437.3     110.00
      3      843.42   20.89  0.30( 0.13) 0.43     504.1     100.00
      4      790.36   23.72  0.30( 0.13) 0.43     510.2     150.00
    TOTAL AREA(ACRES) =      510.2

****************************************************************************
  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     3671.09   34.30    1.501  0.30( 0.26) 0.85    2859.0   31100.00
      2     4235.21   48.40    1.227  0.30( 0.25) 0.84    4321.7   13210.00
      3     4248.94   48.79    1.221  0.30( 0.25) 0.84    4359.9   13200.00
      4     4256.36   50.21    1.197  0.30( 0.25) 0.84    4464.4   13100.00
      5     3798.21   75.40    0.957  0.30( 0.25) 0.83    5715.3   13000.00
      6     3738.44   77.72    0.942  0.30( 0.25) 0.83    5735.1   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.00 =   41886.54 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      949.30   13.75    2.545  0.30( 0.13) 0.43     435.3     120.00
      2      948.59   13.87    2.531  0.30( 0.13) 0.43     437.3     110.00
      3      843.42   20.89    1.987  0.30( 0.13) 0.43     504.1     100.00
      4      790.36   23.72    1.851  0.30( 0.13) 0.43     510.2     150.00
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE  13305.00 =    9867.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1     3654.01   13.75    2.545  0.30( 0.22) 0.74    1581.3     120.00
      2     3658.96   13.87    2.531  0.30( 0.22) 0.74    1592.9     110.00
      3     3951.96   20.89    1.987  0.30( 0.23) 0.76    2245.6     100.00
      4     4043.05   23.72    1.851  0.30( 0.23) 0.77    2487.5     150.00
      5     4300.61   34.30    1.501  0.30( 0.24) 0.79    3369.2   31100.00
      6     4738.95   48.40    1.227  0.30( 0.24) 0.80    4831.9   13210.00
      7     4749.70   48.79    1.221  0.30( 0.24) 0.80    4870.1   13200.00
      8     4746.30   50.21    1.197  0.30( 0.24) 0.80    4974.6   13100.00
      9     4178.05   75.40    0.957  0.30( 0.24) 0.80    6225.5   13000.00
     10     4111.20   77.72    0.942  0.30( 0.24) 0.80    6245.3   13010.00
    TOTAL AREA(ACRES) =      6245.3
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     4749.70  Tc(MIN.) =   48.786
  EFFECTIVE AREA(ACRES) =   4870.09  AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.76
  TOTAL AREA(ACRES) =     6245.3
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.00 =   41886.54 FEET.

****************************************************************************
  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  13306.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    315.00  DOWNSTREAM(FEET) =    245.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =  4408.41   CHANNEL SLOPE =  0.0158
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.67
  *  15 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
  PUBLIC PARK                B       68.77      0.30     0.850    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.850
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4776.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.57
  AVERAGE FLOW DEPTH(FEET) =   5.67   TRAVEL TIME(MIN.) =   5.85
  Tc(MIN.) =   54.63
  SUBAREA AREA(ACRES) =    68.77       SUBAREA RUNOFF(CFS) =   54.48
  EFFECTIVE AREA(ACRES) =   4938.86     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
  TOTAL AREA(ACRES) =     6314.1         PEAK FLOW RATE(CFS) =    4749.70
  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) =   5.65

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.65   FLOW VELOCITY(FEET/SEC.) =  12.56
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13306.00 =   46294.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13306.00 TO NODE  13306.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   54.63
  *  15 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
  NATURAL POOR COVER
  "BARREN"                   B       21.50      0.30     1.000    86
  COMMERCIAL                 B       15.30      0.30     0.100    56
  NATURAL FAIR COVER
  "GRASS"                    B        0.80      0.30     1.000    69
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        0.60      0.30     1.000    65
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        8.00      0.30     0.900    56
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.10      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.685
  SUBAREA AREA(ACRES) =   46.30      SUBAREA RUNOFF(CFS) =   38.73
  EFFECTIVE AREA(ACRES) =   4985.16   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.80
  TOTAL AREA(ACRES) =     6360.4       PEAK FLOW RATE(CFS) =    4749.70
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13306.00 TO NODE  13306.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   54.63
  *  15 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
  NATURAL POOR COVER
  "BARREN"                   B       43.30      0.30     1.000    86
  COMMERCIAL                 B        4.90      0.30     0.100    56
  NATURAL FAIR COVER
  "GRASS"                    B        5.70      0.30     1.000    69
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        0.50      0.30     1.000    65
  PUBLIC PARK                B        1.10      0.30     0.850    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        3.10      0.30     0.900    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.917
  SUBAREA AREA(ACRES) =   58.60      SUBAREA RUNOFF(CFS) =   45.37
  EFFECTIVE AREA(ACRES) =   5043.76   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.80
  TOTAL AREA(ACRES) =     6419.0       PEAK FLOW RATE(CFS) =    4749.70
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13306.00 TO NODE  13306.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   54.63
  *  15 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
```

```
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        6.80      0.30     1.000    65
  NATURAL POOR COVER
  "BARREN"                   B        0.70      0.30     1.000    86
  COMMERCIAL                 B        1.10      0.30     0.100    56
  NATURAL FAIR COVER
  "GRASS"                    B        0.50      0.30     1.000    69
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        0.10      0.30     1.000    65
  PUBLIC PARK                B        0.50      0.30     0.850    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.890
  SUBAREA AREA(ACRES) =    9.70      SUBAREA RUNOFF(CFS) =    7.58
  EFFECTIVE AREA(ACRES) =   5053.46   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.80
  TOTAL AREA(ACRES) =     6428.7       PEAK FLOW RATE(CFS) =    4749.70
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13306.00 TO NODE  13306.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   54.63
  *  15 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
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        2.20      0.30     0.900    56
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.10      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.904
  SUBAREA AREA(ACRES) =    2.30      SUBAREA RUNOFF(CFS) =    1.79
  EFFECTIVE AREA(ACRES) =   5055.76   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.80
  TOTAL AREA(ACRES) =     6431.0       PEAK FLOW RATE(CFS) =    4749.70
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  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) =   5.58
  CHANNEL FLOW THRU SUBAREA(CFS) =    4749.70
  FLOW VELOCITY(FEET/SEC.) =  12.75   FLOW DEPTH(FEET) =   5.58
  TRAVEL TIME(MIN.) =   2.02   Tc(MIN.) =   56.65
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13307.00 =   47838.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13307.00 IS CODE =  81
```



```
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   56.65
  *  15 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
  COMMERCIAL                 B        0.20      0.30     0.100    56
  NATURAL FAIR COVER
  "GRASS"                    B        0.10      0.30     1.000    69
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        0.20      0.30     1.000    65
  NATURAL POOR COVER
  "BARREN"                   B        3.70      0.30     1.000    86
  COMMERCIAL                 B        0.30      0.30     0.100    56
  NATURAL FAIR COVER
  "GRASS"                    B        3.20      0.30     1.000    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.942
  SUBAREA AREA(ACRES) =    7.70      SUBAREA RUNOFF(CFS) =    5.71
  EFFECTIVE AREA(ACRES) =   5063.46   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.80
  TOTAL AREA(ACRES) =     6438.7       PEAK FLOW RATE(CFS) =    4749.70
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13307.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   56.65
  *  15 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
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        3.60      0.30     1.000    65
  NATURAL FAIR COVER
  "GRASS"                    B        1.90      0.30     1.000    69
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.60      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =    6.10      SUBAREA RUNOFF(CFS) =    4.43
  EFFECTIVE AREA(ACRES) =   5069.56   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.80
  TOTAL AREA(ACRES) =     6444.8       PEAK FLOW RATE(CFS) =    4749.70
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  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) = 6.67
CHANNEL FLOW THRU SUBAREA(CFS) = 4749.70
FLOW VELOCITY(FEET/SEC.) = 10.18 FLOW DEPTH(FEET) = 6.67
TRAVEL TIME(MIN.) = 1.52 Tc(MIN.) = 58.16
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.78 FEET.

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==
MAINLINE Tc(MIN.) = 58.16
* 15 YEAR RAINFALL INTENSITY(INCH/HR) = 1.086
SUBAREA LOSS RATE DATA(AMC II):

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DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"GRASS"	B	0.10	0.30	1.000	69
NATURAL FAIR COVER					
"OPEN BRUSH"	B	0.20	0.30	1.000	66
NATURAL FAIR COVER					
"WOODLAND,GRASS"	B	5.00	0.30	1.000	65
COMMERCIAL	B	3.20	0.30	0.100	56
NATURAL FAIR COVER					
"GRASS"	B	0.10	0.30	1.000	69
NATURAL FAIR COVER					
"OPEN BRUSH"	B	0.90	0.30	1.000	66

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.697
SUBAREA AREA(ACRES) = 9.50 SUBAREA RUNOFF(CFS) = 7.50
EFFECTIVE AREA(ACRES) = 5079.06 AREA-AVERAGED Fm(INCH/HR) = 0.24
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.80
TOTAL AREA(ACRES) = 6454.3 PEAK FLOW RATE(CFS) = 4749.70
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==
MAINLINE Tc(MIN.) = 58.16
* 15 YEAR RAINFALL INTENSITY(INCH/HR) = 1.086
SUBAREA LOSS RATE DATA(AMC II):

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DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
APARTMENTS	B	0.30	0.30	0.200	56
NATURAL POOR COVER					
"BARREN"	B	0.20	0.30	1.000	86
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	B	1.00	0.30	1.000	63
COMMERCIAL	B	41.90	0.30	0.100	56
NATURAL FAIR COVER					
"GRASS"	B	7.20	0.30	1.000	69
NATURAL FAIR COVER					
"OPEN BRUSH"	B	25.00	0.30	1.000	66

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.498
SUBAREA AREA(ACRES) = 75.60 SUBAREA RUNOFF(CFS) = 63.71
EFFECTIVE AREA(ACRES) = 5154.66 AREA-AVERAGED Fm(INCH/HR) = 0.24
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.79
TOTAL AREA(ACRES) = 6529.9 PEAK FLOW RATE(CFS) = 4749.70
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==
MAINLINE Tc(MIN.) = 58.16
* 15 YEAR RAINFALL INTENSITY(INCH/HR) = 1.086
SUBAREA LOSS RATE DATA(AMC II):

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DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	B	0.10	0.30	0.850	56
AGRICULTURAL POOR COVER					
"ROW CROPS,CONTOURED"	B	0.90	0.30	1.000	79
SCHOOL	B	0.30	0.30	0.600	56
NATURAL FAIR COVER					
"WOODLAND,GRASS"	B	13.20	0.30	1.000	65
APARTMENTS	B	0.50	0.30	0.200	56
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	B	0.60	0.30	1.000	63

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.966
SUBAREA AREA(ACRES) = 15.60 SUBAREA RUNOFF(CFS) = 11.18
EFFECTIVE AREA(ACRES) = 5170.26 AREA-AVERAGED Fm(INCH/HR) = 0.24
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.79
TOTAL AREA(ACRES) = 6545.5 PEAK FLOW RATE(CFS) = 4749.70
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==
MAINLINE Tc(MIN.) = 58.16
* 15 YEAR RAINFALL INTENSITY(INCH/HR) = 1.086
SUBAREA LOSS RATE DATA(AMC II):

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DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	33.90	0.30	0.100	56
NATURAL FAIR COVER					
"GRASS"	B	17.60	0.30	1.000	69
NATURAL FAIR COVER					
"OPEN BRUSH"	B	16.80	0.30	1.000	66
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	B	0.60	0.30	0.200	56
RESIDENTIAL					
"8-10 DWELLINGS/ACRE"	B	1.50	0.30	0.400	56
AGRICULTURAL POOR COVER					
"ROW CROPS,CONTOURED"	B	10.00	0.30	1.000	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.603
SUBAREA AREA(ACRES) = 80.40 SUBAREA RUNOFF(CFS) = 65.46

```
  EFFECTIVE AREA(ACRES) =   5250.66   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.79
  TOTAL AREA(ACRES) =     6625.9       PEAK FLOW RATE(CFS) =    4749.70
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   58.16
  *  15 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
  SCHOOL                     B        0.30      0.30      0.600    56
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.70      0.30      1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.880
  SUBAREA AREA(ACRES) =    1.00      SUBAREA RUNOFF(CFS) =    0.74
  EFFECTIVE AREA(ACRES) =   5251.66   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.79
  TOTAL AREA(ACRES) =     6626.9       PEAK FLOW RATE(CFS) =    4749.70
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   58.16
  *  15 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
  NATURAL FAIR COVER
  "GRASS"                    B        0.30      0.30      1.000    69
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.80      0.30      1.000    65
  NATURAL FAIR COVER
  "GRASS"                    B        0.50      0.30      1.000    69
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.20      0.30      1.000    65
  NATURAL FAIR COVER
  "GRASS"                    B        0.30      0.30      1.000    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =    2.10      SUBAREA RUNOFF(CFS) =    1.48
  EFFECTIVE AREA(ACRES) =   5253.76   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.79
  TOTAL AREA(ACRES) =     6629.0       PEAK FLOW RATE(CFS) =    4749.70
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
```

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HZ-31010.2


```
============================================================================
  MAINLINE Tc(MIN.) =   58.16
  *  15 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
  NATURAL FAIR COVER
  "GRASS"                    B        1.20      0.30      1.000    69
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.50      0.30      1.000    66
  PUBLIC PARK                B        1.70      0.30      0.850    56
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        7.20      0.30      1.000    65
  NATURAL FAIR COVER
  "GRASS"                    B        1.00      0.30      1.000    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.978
  SUBAREA AREA(ACRES) =   11.60      SUBAREA RUNOFF(CFS) =    8.27
  EFFECTIVE AREA(ACRES) =   5265.36   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.79
  TOTAL AREA(ACRES) =     6640.6       PEAK FLOW RATE(CFS) =    4749.70
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =     6640.6  TC(MIN.) =     58.16
  EFFECTIVE AREA(ACRES) =   5265.36  AREA-AVERAGED Fm(INCH/HR)=  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.791
  PEAK FLOW RATE(CFS)    =    4749.70

  ** PEAK FLOW RATE TABLE **
   STREAM       Q       Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1     3654.01   23.90    1.843  0.30( 0.22) 0.74    1976.6     120.00
      2     3658.96   24.02    1.837  0.30( 0.22) 0.74    1988.2     110.00
      3     3951.96   30.81    1.581  0.30( 0.23) 0.75    2640.8     100.00
      4     4043.05   33.57    1.518  0.30( 0.23) 0.76    2882.7     150.00
      5     4300.61   43.97    1.303  0.30( 0.23) 0.78    3764.5   31100.00
      6     4738.95   57.79    1.091  0.30( 0.24) 0.79    5227.2   13210.00
      7     4749.70   58.16    1.086  0.30( 0.24) 0.79    5265.4   13200.00
      8     4746.30   59.58    1.066  0.30( 0.24) 0.79    5369.9   13100.00
      9     4178.05   85.16    0.892  0.30( 0.24) 0.79    6620.8   13000.00
     10     4111.20   87.52    0.877  0.30( 0.24) 0.79    6640.6   13010.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

HZ-31113.2

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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:




 ************************* DESCRIPTION OF STUDY *************************
* GOBERNADORA WATERSHED STUDY - RATIONAL METHOD                         *
* REGIONAL WATERSHED S33- FREE DRAINING - ULTIMATE CONDITION            *
* 100-YR EV AUGUST 2018 ROKAMOTO                                       *
 ************************************************************************

  FILE NAME: RU00EV33.DAT
  TIME/DATE OF STUDY: 14:13 08/29/2018
==============================================================================
  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
  *DATA BANK RAINFALL USED*
  *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: S31X00.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     3200.10   33.81  0.30( 0.24) 0.81    2538.8   13100.00
      2     3223.67   57.47  0.30( 0.24) 0.81    3777.0   13000.00
      3     3120.61   59.66  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: S32X00.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS) (MIN.)  (INCH/HR)          (ACRES)    NODE
      1     1444.32   32.09  0.30( 0.25) 0.83    1115.4   13210.00
      2     1446.69   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     1444.32   32.09  0.30( 0.25) 0.83    1115.4   13210.00
      2     1446.69   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     1444.32   32.09    1.684  0.30( 0.25) 0.83    1115.4   13210.00
      2     1446.69   32.62    1.669  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     3200.10   33.81    1.635  0.30( 0.24) 0.81    2538.8   13100.00
      2     3223.67   57.47    1.211  0.30( 0.24) 0.81    3777.0   13000.00
      3     3120.61   59.66    1.186  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     4588.46   32.09    1.684  0.30( 0.24) 0.82    3524.7   13210.00
      2     4608.23   32.62    1.669  0.30( 0.24) 0.82    3576.6   13200.00
      3     4612.48   33.81    1.635  0.30( 0.24) 0.82    3666.4   13100.00
      4     4204.26   57.47    1.211  0.30( 0.24) 0.81    4904.6   13000.00
```

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     5     4075.32   59.66    1.186  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) =     4612.48  Tc(MIN.) =   33.814
  EFFECTIVE AREA(ACRES) =   3666.43  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  13222.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13222.00 TO NODE  13222.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  13222.00 TO NODE  13301.00 IS CODE =  56
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    427.51  DOWNSTREAM(FEET) =    382.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2533.33   CHANNEL SLOPE =  0.0180
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.38
  *  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
  COMMERCIAL                 B        1.40      0.30     0.100    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       15.60      0.30     1.000    66
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.10      0.30     0.600    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        5.30      0.30     1.000    79
  NATURAL POOR COVER
  "BARREN"                   B        0.20      0.30     1.000    86
  COMMERCIAL                 B       22.60      0.30     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.521
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4640.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.04
  AVERAGE FLOW DEPTH(FEET) =   5.38   TRAVEL TIME(MIN.) =   3.24
  Tc(MIN.) =   37.05
  SUBAREA AREA(ACRES) =    45.20       SUBAREA RUNOFF(CFS) =   56.80
  EFFECTIVE AREA(ACRES) =   3711.63     AREA-AVERAGED Fm(INCH/HR) =   0.24
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =     4969.6         PEAK FLOW RATE(CFS) =    4612.48
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

S33-01


```
  GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
  "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
  *ESTIMATED CHANNEL HEIGHT(FEET) =   5.37

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.37   FLOW VELOCITY(FEET/SEC.) =  13.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13301.00 =   34659.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   37.05
  *  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
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        1.00      0.30     1.000    79
  NATURAL POOR COVER
  "BARREN"                   B        0.50      0.30     1.000    86
  COMMERCIAL                 B        7.40      0.30     0.100    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        4.70      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        2.90      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.596
  SUBAREA AREA(ACRES) =   16.50       SUBAREA RUNOFF(CFS) =   20.40
  EFFECTIVE AREA(ACRES) =   3728.13   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =     4986.1       PEAK FLOW RATE(CFS) =    4612.48
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

S33-01

```
****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   37.05
  *  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
  NATURAL POOR COVER
  "BARREN"                   B        1.30      0.30     1.000    86
  COMMERCIAL                 B        0.20      0.30     0.100    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        5.30      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.30      0.30     1.000    65
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.20      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.60      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.977
```

HZ-31111

```
  SUBAREA AREA(ACRES) =    7.90      SUBAREA RUNOFF(CFS) =    8.95
  EFFECTIVE AREA(ACRES) =   3736.03   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =     4994.0       PEAK FLOW RATE(CFS) =    4612.48
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   37.05
  *  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
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        4.30      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.80      0.30     1.000    65
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        1.10      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        6.90      0.30     1.000    66
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        7.90      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        1.00      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   22.00      SUBAREA RUNOFF(CFS) =   24.80
  EFFECTIVE AREA(ACRES) =   3758.03   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =     5016.0       PEAK FLOW RATE(CFS) =    4612.48
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   37.05
  *  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
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.40      0.30     1.000    66
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B       14.60      0.30     1.000    79
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   15.00      SUBAREA RUNOFF(CFS) =   16.91
  EFFECTIVE AREA(ACRES) =   3773.03   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =     5031.0       PEAK FLOW RATE(CFS) =    4612.48
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

HZ-31111

HZ-31111


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****************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  31100.00 TO NODE  31101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   317.00
  ELEVATION DATA: UPSTREAM(FEET) =    801.00  DOWNSTREAM(FEET) =    685.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.641
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.539
  SUBAREA Tc AND LOSS RATE 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"      B        0.50      0.30     1.000    63    8.64
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.30      0.30     1.000    66    8.64
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.30      0.30     1.000    66    8.64
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.21
  TOTAL AREA(ACRES) =      1.10   PEAK FLOW RATE(CFS) =      3.21

****************************************************************************
  FLOW PROCESS FROM NODE  31101.00 TO NODE  31102.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    685.00  DOWNSTREAM(FEET) =    655.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   135.00   CHANNEL SLOPE =  0.2222
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.464
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.50      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.10      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.70      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.73
  AVERAGE FLOW DEPTH(FEET) =   0.50   TRAVEL TIME(MIN.) =   0.33
  Tc(MIN.) =    8.98
```

HZ-31100

HZ-31101

```
  SUBAREA AREA(ACRES) =     1.30       SUBAREA RUNOFF(CFS) =    3.70
  EFFECTIVE AREA(ACRES) =      2.40     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        2.4         PEAK FLOW RATE(CFS) =       6.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.56   FLOW VELOCITY(FEET/SEC.) =   7.22
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31102.00 =     452.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31102.00 TO NODE  31103.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    655.00  DOWNSTREAM(FEET) =    630.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   203.00   CHANNEL SLOPE =  0.1232
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.353
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.30      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.10      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        1.90      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.39
  AVERAGE FLOW DEPTH(FEET) =   0.72   TRAVEL TIME(MIN.) =   0.53
  Tc(MIN.) =    9.50
  SUBAREA AREA(ACRES) =     2.30       SUBAREA RUNOFF(CFS) =    6.32
  EFFECTIVE AREA(ACRES) =      4.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        4.7         PEAK FLOW RATE(CFS) =      12.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.80   FLOW VELOCITY(FEET/SEC.) =   6.79
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31103.00 =     655.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31103.00 TO NODE  31104.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    630.00  DOWNSTREAM(FEET) =    605.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   321.00   CHANNEL SLOPE =  0.0779
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  25 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
```

HZ-31102

HZ-31103

```
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        1.10      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.50      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.19
  AVERAGE FLOW DEPTH(FEET) =   0.97   TRAVEL TIME(MIN.) =   0.86
  Tc(MIN.) =   10.37
  SUBAREA AREA(ACRES) =     3.60       SUBAREA RUNOFF(CFS) =    9.37
  EFFECTIVE AREA(ACRES) =      8.30     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =        8.3         PEAK FLOW RATE(CFS) =      21.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.05   FLOW VELOCITY(FEET/SEC.) =   6.53
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31104.00 =     976.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31104.00 TO NODE  31105.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    605.00  DOWNSTREAM(FEET) =    585.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   288.00   CHANNEL SLOPE =  0.0694
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  25 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
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.70      0.30     1.000    63
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.60      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        3.00      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.10      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      29.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.76
  AVERAGE FLOW DEPTH(FEET) =   1.21   TRAVEL TIME(MIN.) =   0.71
  Tc(MIN.) =   11.08
  SUBAREA AREA(ACRES) =     6.40       SUBAREA RUNOFF(CFS) =   15.98
  EFFECTIVE AREA(ACRES) =     14.70     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       14.7         PEAK FLOW RATE(CFS) =      36.71

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.31   FLOW VELOCITY(FEET/SEC.) =   7.14
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31105.00 =    1264.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31105.00 TO NODE  31106.00 IS CODE =  51
```

HZ-31104

```
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    585.00  DOWNSTREAM(FEET) =    560.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   344.00   CHANNEL SLOPE =  0.0727
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  25 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
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.60      0.30     1.000    63
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        2.80      0.30     1.000    63
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.60      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.10      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.60      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        4.10      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      49.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.83
  AVERAGE FLOW DEPTH(FEET) =   1.45   TRAVEL TIME(MIN.) =   0.73
  Tc(MIN.) =   11.81
  SUBAREA AREA(ACRES) =    10.80       SUBAREA RUNOFF(CFS) =   25.91
  EFFECTIVE AREA(ACRES) =     25.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       25.5         PEAK FLOW RATE(CFS) =      61.17

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.57   FLOW VELOCITY(FEET/SEC.) =   8.22
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31106.00 =    1608.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31106.00 TO NODE  31107.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    560.00  DOWNSTREAM(FEET) =    530.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   619.00   CHANNEL SLOPE =  0.0485
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.787
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.80      0.30     1.000    63
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        1.90      0.30     1.000    63
  NATURAL FAIR COVER
```

HZ-31105

HZ-31106


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  "OPEN BRUSH"               B        1.50      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        8.20      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.70      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      78.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.53
  AVERAGE FLOW DEPTH(FEET) =   1.86   TRAVEL TIME(MIN.) =   1.37
  Tc(MIN.) =   13.18
  SUBAREA AREA(ACRES) =    15.10       SUBAREA RUNOFF(CFS) =   33.79
  EFFECTIVE AREA(ACRES) =     40.60     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       40.6         PEAK FLOW RATE(CFS) =      90.87

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.97   FLOW VELOCITY(FEET/SEC.) =   7.79
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31107.00 =    2227.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31107.00 TO NODE  31108.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    530.00  DOWNSTREAM(FEET) =    515.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   377.00   CHANNEL SLOPE =  0.0398
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  25 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
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.50      0.30     1.000    63
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        6.50      0.30     1.000    63
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        1.30      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        1.10      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        5.50      0.30     1.000    66
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        3.40      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     110.57
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.61
  AVERAGE FLOW DEPTH(FEET) =   2.20   TRAVEL TIME(MIN.) =   0.83
  Tc(MIN.) =   14.01
  SUBAREA AREA(ACRES) =    18.30       SUBAREA RUNOFF(CFS) =   39.41
  EFFECTIVE AREA(ACRES) =     58.90     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       58.9         PEAK FLOW RATE(CFS) =     126.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
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  DEPTH(FEET) =  2.31   FLOW VELOCITY(FEET/SEC.) =   7.89
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31108.00 =    2604.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31108.00 TO NODE  31109.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    515.00  DOWNSTREAM(FEET) =    490.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   520.00   CHANNEL SLOPE =  0.0481
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.590
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.70      0.30     1.000    63
  NATURAL FAIR COVER
  "GRASS"                    B        2.20      0.30     1.000    69
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        3.10      0.30     1.000    66
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.90      0.30     1.000    65
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        7.40      0.30     1.000    63
  NATURAL FAIR COVER
  "GRASS"                    B        0.30      0.30     1.000    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     141.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.71
  AVERAGE FLOW DEPTH(FEET) =   2.33   TRAVEL TIME(MIN.) =   0.99
  Tc(MIN.) =   15.00
  SUBAREA AREA(ACRES) =    14.60       SUBAREA RUNOFF(CFS) =   30.09
  EFFECTIVE AREA(ACRES) =     73.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =       73.5         PEAK FLOW RATE(CFS) =     151.49

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.39   FLOW VELOCITY(FEET/SEC.) =   8.83
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31109.00 =    3124.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31109.00 TO NODE  31109.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   15.00
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.590
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       11.40      0.30     1.000    66
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        8.90      0.30     1.000    65
```

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```
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        1.90      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        9.20      0.30     1.000    66
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        1.40      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   32.80      SUBAREA RUNOFF(CFS) =   67.60
  EFFECTIVE AREA(ACRES) =    106.30   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =      106.3       PEAK FLOW RATE(CFS) =     219.09

****************************************************************************
  FLOW PROCESS FROM NODE  31109.00 TO NODE  31110.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    490.00  DOWNSTREAM(FEET) =    432.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1420.00   CHANNEL SLOPE =  0.0408
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.368
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "GRASS"                    B        0.80      0.30     1.000    69
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.60      0.30     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.10      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        1.30      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        4.00      0.30     1.000    65
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        1.50      0.30     1.000    63
  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) =     226.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.21
  AVERAGE FLOW DEPTH(FEET) =   2.87   TRAVEL TIME(MIN.) =   2.57
  Tc(MIN.) =   17.57
  SUBAREA AREA(ACRES) =     8.30       SUBAREA RUNOFF(CFS) =   15.45
  EFFECTIVE AREA(ACRES) =    114.60     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      114.6         PEAK FLOW RATE(CFS) =     219.09
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.83   FLOW VELOCITY(FEET/SEC.) =   9.13
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  31110.00 =    4544.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  31110.00 TO NODE  31110.00 IS CODE =  81
----------------------------------------------------------------------------
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```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  MAINLINE Tc(MIN.) =   17.57
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.368
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "GRASS"                     B        0.30      0.30      1.000    69
  NATURAL FAIR COVER
  "OPEN BRUSH"                B        9.60      0.30      1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"          B        0.40      0.30      0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        6.20      0.30      1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"            B        3.90      0.30      1.000    65
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        1.40      0.30      1.000    79
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.998
  SUBAREA AREA(ACRES) =   21.80      SUBAREA RUNOFF(CFS) =   40.59
  EFFECTIVE AREA(ACRES) =    136.40   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =      136.4       PEAK FLOW RATE(CFS) =     253.91

********************************************************************************
  FLOW PROCESS FROM NODE  31110.00 TO NODE  13301.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    432.00  DOWNSTREAM(FEET) =    382.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1847.00   CHANNEL SLOPE =  0.0271
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.00
  *  25 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
  NATURAL POOR COVER
  "BARREN"                    B        4.90      0.30      1.000    86
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        1.50      0.30      1.000    79
  RESIDENTIAL
  ".4 DWELLING/ACRE"          B        0.60      0.30      0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        2.50      0.30      1.000    79
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        5.30      0.30      1.000    79
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        3.30      0.30      1.000    79
  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) =     268.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.23
  AVERAGE FLOW DEPTH(FEET) =   3.30   TRAVEL TIME(MIN.) =   3.74
  Tc(MIN.) =   21.31
```

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```
  SUBAREA AREA(ACRES) =    18.10       SUBAREA RUNOFF(CFS) =   29.72
  EFFECTIVE AREA(ACRES) =    154.50     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   1.00
  TOTAL AREA(ACRES) =      154.5         PEAK FLOW RATE(CFS) =     253.91
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.23   FLOW VELOCITY(FEET/SEC.) =   8.11
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  13301.00 =    6391.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 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      253.91   21.31    2.123  0.30( 0.30) 1.00     154.5   31100.00
  LONGEST FLOWPATH FROM NODE  31100.00 TO NODE  13301.00 =    6391.00 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     4588.46   35.33    1.595  0.30( 0.24) 0.81    3631.3   13210.00
      2     4608.23   35.86    1.582  0.30( 0.24) 0.81    3683.2   13200.00
      3     4612.48   37.05    1.553  0.30( 0.24) 0.81    3773.0   13100.00
      4     4204.26   60.80    1.173  0.30( 0.24) 0.81    5011.2   13000.00
      5     4103.54   63.03    1.149  0.30( 0.24) 0.81    5031.0   13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13301.00 =   34659.82 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1     4103.92   21.31    2.123  0.30( 0.25) 0.83    2344.8   31100.00
      2     4768.80   35.33    1.595  0.30( 0.25) 0.82    3785.8   13210.00
      3     4786.72   35.86    1.582  0.30( 0.25) 0.82    3837.7   13200.00
      4     4786.92   37.05    1.553  0.30( 0.25) 0.82    3927.5   13100.00
      5     4325.85   60.80    1.173  0.30( 0.24) 0.82    5165.7   13000.00
      6     4221.84   63.03    1.149  0.30( 0.24) 0.82    5185.5   13010.00
    TOTAL AREA(ACRES) =      5185.5

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     4786.92  Tc(MIN.) =   37.052
  EFFECTIVE AREA(ACRES) =   3927.53  AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     5185.5
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13301.00 =   34659.82 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13301.00 IS CODE =  12
--------------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
================================================================================

********************************************************************************
  FLOW PROCESS FROM NODE  13301.00 TO NODE  13302.00 IS CODE =  56
```

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----------------------------------------------------------------------------
  >>>>>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) =   7.35
  *  25 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
  NATURAL FAIR COVER
  "GRASS"                    B        9.42      0.30     1.000    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4792.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.05
  AVERAGE FLOW DEPTH(FEET) =   7.35   TRAVEL TIME(MIN.) =   2.10
  Tc(MIN.) =   39.15
  SUBAREA AREA(ACRES) =     9.42       SUBAREA RUNOFF(CFS) =   10.21
  EFFECTIVE AREA(ACRES) =   3936.95     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.82
  TOTAL AREA(ACRES) =     5194.9         PEAK FLOW RATE(CFS) =    4786.92
  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) =   7.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.34   FLOW VELOCITY(FEET/SEC.) =   9.05
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13302.00 =   35800.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13302.00 TO NODE  13302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   39.15
  *  25 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
  NATURAL POOR COVER
  "BARREN"                   B       13.80      0.30     1.000    86
  NATURAL POOR COVER
  "BARREN"                   B        2.60      0.30     1.000    86
  COMMERCIAL                 B        1.10      0.30     0.100    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        3.50      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        6.90      0.30     1.000    79
  NATURAL POOR COVER
  "BARREN"                   B        0.20      0.30     1.000    86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.952
  SUBAREA AREA(ACRES) =   28.10      SUBAREA RUNOFF(CFS) =   30.83
```

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  EFFECTIVE AREA(ACRES) =   3965.05   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     5223.0       PEAK FLOW RATE(CFS) =    4786.92
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13302.00 TO NODE  13302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   39.15
  *  25 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
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        0.10      0.30     1.000    79
  COMMERCIAL                 B        0.10      0.30     0.100    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        2.40      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        0.50      0.30     1.000    79
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.894
  SUBAREA AREA(ACRES) =     3.10      SUBAREA RUNOFF(CFS) =     3.45
  EFFECTIVE AREA(ACRES) =   3968.15   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     5226.1       PEAK FLOW RATE(CFS) =    4786.92
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13302.00 TO NODE  13302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   39.15
  *  25 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
  NATURAL POOR COVER
  "BARREN"                   B        0.10      0.30     1.000    86
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.60      0.30     1.000    66
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        3.10      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.40      0.30     1.000    65
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.20      0.30     1.000    63
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       13.80      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   20.20      SUBAREA RUNOFF(CFS) =   21.90
  EFFECTIVE AREA(ACRES) =   3988.35   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =     5246.4       PEAK FLOW RATE(CFS) =    4786.92
```

HZ-31112

HZ-206

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13302.00 TO NODE 13302.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 39.15
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.505 **HZ-206**
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL POOR COVER					
"ROW CROPS,CONTOURED"	B	34.60	0.30	1.000	79
NATURAL FAIR COVER					
"WOODLAND,GRASS"	B	2.40	0.30	1.000	65
NATURAL FAIR COVER					
"OPEN BRUSH"	B	22.60	0.30	1.000	66
AGRICULTURAL POOR COVER					
"ROW CROPS,CONTOURED"	B	11.60	0.30	1.000	79
APARTMENTS	B	0.40	0.30	0.200	56
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	B	4.80	0.30	1.000	63

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.996
SUBAREA AREA(ACRES) = 76.40 SUBAREA RUNOFF(CFS) = 82.93
EFFECTIVE AREA(ACRES) = 4064.75 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83
TOTAL AREA(ACRES) = 5322.8 PEAK FLOW RATE(CFS) = 4786.92
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13302.00 TO NODE 13302.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 39.15
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.505 **HZ-206**
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"GRASS"	B	1.60	0.30	1.000	69
NATURAL FAIR COVER					
"OPEN BRUSH"	B	46.40	0.30	1.000	66
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	B	0.10	0.30	0.200	56
AGRICULTURAL POOR COVER					
"ROW CROPS,CONTOURED"	B	60.70	0.30	1.000	79
NATURAL FAIR COVER					
"WOODLAND,GRASS"	B	5.80	0.30	1.000	65

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.999
SUBAREA AREA(ACRES) = 114.60 SUBAREA RUNOFF(CFS) = 124.29
EFFECTIVE AREA(ACRES) = 4179.35 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83
TOTAL AREA(ACRES) = 5437.4 PEAK FLOW RATE(CFS) = 4786.92
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
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) = 4786.92
FLOW VELOCITY(FEET/SEC.) = 10.40 FLOW DEPTH(FEET) = 6.60
TRAVEL TIME(MIN.) = 3.52 Tc(MIN.) = 42.67
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13303.00 = 37994.87 FEET.

****
FLOW PROCESS FROM NODE 13303.00 TO NODE 13303.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 42.67
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.433 **HZ-207**
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL POOR COVER					
"BARREN"	B	0.20	0.30	1.000	86
NATURAL FAIR COVER					
"WOODLAND,GRASS"	B	0.40	0.30	1.000	65
NATURAL POOR COVER					
"BARREN"	B	0.80	0.30	1.000	86
COMMERCIAL	B	1.40	0.30	0.100	56
NATURAL FAIR COVER					
"GRASS"	B	2.60	0.30	1.000	69
NATURAL FAIR COVER					
"OPEN BRUSH"	B	2.20	0.30	1.000	66

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.834
SUBAREA AREA(ACRES) = 7.60 SUBAREA RUNOFF(CFS) = 8.09
EFFECTIVE AREA(ACRES) = 4186.95 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83
TOTAL AREA(ACRES) = 5445.0 PEAK FLOW RATE(CFS) = 4786.92
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13303.00 TO NODE 13303.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 42.67
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.433 **HZ-207**
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL POOR COVER					
"ROW CROPS,CONTOURED"	B	3.10	0.30	1.000	79

```
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        3.40      0.30     1.000    65
  NATURAL POOR COVER
  "BARREN"                   B        0.50      0.30     1.000    86
  NATURAL FAIR COVER
  "CHAPARRAL,BROADLEAF"      B        0.20      0.30     1.000    63
  COMMERCIAL                 B        3.60      0.30     0.100    56
  NATURAL FAIR COVER
  "GRASS"                    B        4.00      0.30     1.000    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.781
  SUBAREA AREA(ACRES) =   14.80      SUBAREA RUNOFF(CFS) =   15.97
  EFFECTIVE AREA(ACRES) =   4201.75   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5459.8       PEAK FLOW RATE(CFS) =    4786.92
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   42.67
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.433
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       14.60      0.30     1.000    66
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        6.30      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        3.70      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   24.60      SUBAREA RUNOFF(CFS) =   25.09
  EFFECTIVE AREA(ACRES) =   4226.35   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5484.4       PEAK FLOW RATE(CFS) =    4786.92
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   42.67
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.433
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL POOR COVER
  "BARREN"                   B        0.50      0.30     1.000    86
  COMMERCIAL                 B        0.30      0.30     0.100    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.20      0.30     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.80      0.30     0.900    56
```

HZ-207

HZ-31113

HZ-31113


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  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        1.60      0.30     1.000    79
  NATURAL POOR COVER
  "BARREN"                   B       31.90      0.30     1.000    86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.990
  SUBAREA AREA(ACRES) =   35.30      SUBAREA RUNOFF(CFS) =   36.10
  EFFECTIVE AREA(ACRES) =   4261.65   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5519.6       PEAK FLOW RATE(CFS) =    4786.92
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   42.67
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.433
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        1.70      0.30     0.100    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.30      0.30     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        2.60      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        5.50      0.30     1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.20      0.30     1.000    65
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.20      0.30     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.830
  SUBAREA AREA(ACRES) =   10.50      SUBAREA RUNOFF(CFS) =   11.19
  EFFECTIVE AREA(ACRES) =   4272.15   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5530.1       PEAK FLOW RATE(CFS) =    4786.92
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13303.00 TO NODE  13303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   42.67
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.433
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        1.30      0.30     0.900    56
  NATURAL POOR COVER
  "BARREN"                   B        0.30      0.30     1.000    86
  COMMERCIAL                 B        0.20      0.30     0.100    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.30      0.30     1.000    66
```

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  RESIDENTIAL
  ".4 DWELLING/ACRE"          B        6.50      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        3.00      0.30     1.000    79
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.917
  SUBAREA AREA(ACRES) =   11.60      SUBAREA RUNOFF(CFS) =   12.09
  EFFECTIVE AREA(ACRES) =   4283.75   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5541.8       PEAK FLOW RATE(CFS) =    4786.92
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  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) =   7.60
  *  25 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
  PUBLIC PARK               B       13.84      0.30     0.850    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.850
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4794.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.66
  AVERAGE FLOW DEPTH(FEET) =   7.60   TRAVEL TIME(MIN.) =   1.78
  Tc(MIN.) =   44.45
  SUBAREA AREA(ACRES) =    13.84       SUBAREA RUNOFF(CFS) =   14.27
  EFFECTIVE AREA(ACRES) =   4297.59     AREA-AVERAGED Fm(INCH/HR) =   0.25
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.83
  TOTAL AREA(ACRES) =     5555.6         PEAK FLOW RATE(CFS) =    4786.92
  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) =   7.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  7.60   FLOW VELOCITY(FEET/SEC.) =   8.66
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13304.00 =   38920.27 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13304.00 TO NODE  13304.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   44.45
  *  25 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
  NATURAL POOR COVER
```

S33-05.5

HZ-31114


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  "BARREN"                    B        7.80      0.30     1.000    86
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        1.70      0.30     1.000    79
  NATURAL POOR COVER
  "BARREN"                    B        9.40      0.30     1.000    86
  NATURAL FAIR COVER
  "OPEN BRUSH"                B        1.20      0.30     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"          B        0.10      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        2.60      0.30     1.000    79
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   22.80      SUBAREA RUNOFF(CFS) =   22.59
  EFFECTIVE AREA(ACRES) =   4320.39   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5578.4       PEAK FLOW RATE(CFS) =    4786.92
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13304.00 TO NODE  13304.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   44.45
  *  25 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
  NATURAL FAIR COVER
  "WOODLAND,GRASS"            B        0.20      0.30     1.000    65
  NATURAL FAIR COVER
  "OPEN BRUSH"                B        0.30      0.30     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"          B        0.20      0.30     0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"       B        2.70      0.30     1.000    79
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.994
  SUBAREA AREA(ACRES) =    3.40      SUBAREA RUNOFF(CFS) =    3.37
  EFFECTIVE AREA(ACRES) =   4323.79   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =     5581.8       PEAK FLOW RATE(CFS) =    4786.92
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  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) =   6.16
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.329
  SUBAREA LOSS RATE DATA(AMC  II):
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S33-05.6

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 DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
NATURAL FAIR COVER
"GRASS"                    B       27.39      0.30      1.000    69
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    4799.60
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.39
AVERAGE FLOW DEPTH(FEET) =   6.15   TRAVEL TIME(MIN.) =   4.34
Tc(MIN.) =   48.79
SUBAREA AREA(ACRES) =    27.39       SUBAREA RUNOFF(CFS) =   25.36
EFFECTIVE AREA(ACRES) =   4351.18     AREA-AVERAGED Fm(INCH/HR) =   0.25
AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.84
TOTAL AREA(ACRES) =     5609.2         PEAK FLOW RATE(CFS) =    4786.92
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) =   6.15

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  6.15   FLOW VELOCITY(FEET/SEC.) =  11.38
LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.00 =   41886.54 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
MAINLINE Tc(MIN.) =   48.79
*  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.329
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
NATURAL POOR COVER
"BARREN"                   B       18.40      0.30      1.000    86
NATURAL FAIR COVER
"MEADOWS"                  B        1.20      0.30      1.000    70
NATURAL FAIR COVER
"WOODLAND,GRASS"           B        0.10      0.30      1.000    65
NATURAL POOR COVER
"BARREN"                   B       26.60      0.30      1.000    86
COMMERCIAL                 B        3.90      0.30      0.100    56
AGRICULTURAL POOR COVER
"FALLOW"                   B        3.00      0.30      1.000    86
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.934
SUBAREA AREA(ACRES) =   53.20      SUBAREA RUNOFF(CFS) =   50.20
EFFECTIVE AREA(ACRES) =   4404.38   AREA-AVERAGED Fm(INCH/HR) =  0.25
AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
TOTAL AREA(ACRES) =     5662.4       PEAK FLOW RATE(CFS) =    4786.92
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
MAINLINE Tc(MIN.) =   48.79
```


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```
*  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
AGRICULTURAL POOR COVER
"ROW CROPS,CONTOURED"      B        1.10      0.30      1.000    79
NATURAL FAIR COVER
"WOODLAND,GRASS"           B        0.20      0.30      1.000    65
NATURAL POOR COVER
"BARREN"                   B       14.00      0.30      1.000    86
COMMERCIAL                 B        4.30      0.30      0.100    56
AGRICULTURAL POOR COVER
"FALLOW"                   B        5.30      0.30      1.000    86
NATURAL FAIR COVER
"GRASS"                    B        2.70      0.30      1.000    69
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.860
SUBAREA AREA(ACRES) =   27.60      SUBAREA RUNOFF(CFS) =   26.60
EFFECTIVE AREA(ACRES) =   4431.98   AREA-AVERAGED Fm(INCH/HR) =  0.25
AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
TOTAL AREA(ACRES) =     5690.0       PEAK FLOW RATE(CFS) =    4786.92
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
MAINLINE Tc(MIN.) =   48.79
*  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.329
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
NATURAL FAIR COVER
"MEADOWS"                  B        3.20      0.30      1.000    70
NATURAL FAIR COVER
"OPEN BRUSH"               B        6.10      0.30      1.000    66
RESIDENTIAL
".4 DWELLING/ACRE"         B        7.50      0.30      0.900    56
AGRICULTURAL POOR COVER
"ROW CROPS,CONTOURED"      B        5.40      0.30      1.000    79
NATURAL FAIR COVER
"WOODLAND,GRASS"           B        1.60      0.30      1.000    65
NATURAL POOR COVER
"BARREN"                   B        1.90      0.30      1.000    86
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.971
SUBAREA AREA(ACRES) =   25.70      SUBAREA RUNOFF(CFS) =   23.99
EFFECTIVE AREA(ACRES) =   4457.68   AREA-AVERAGED Fm(INCH/HR) =  0.25
AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
TOTAL AREA(ACRES) =     5715.7       PEAK FLOW RATE(CFS) =    4786.92
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
```

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```
  MAINLINE Tc(MIN.) =   48.79
  *  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
  COMMERCIAL                 B        2.00      0.30      0.100    56
  AGRICULTURAL POOR COVER
  "FALLOW"                   B        3.70      0.30      1.000    86
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.10      0.30      1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        2.60      0.30      0.900    56
  AGRICULTURAL POOR COVER
  "ROW CROPS,CONTOURED"      B        0.20      0.30      1.000    79
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.10      0.30      1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.807
  SUBAREA AREA(ACRES) =   10.70      SUBAREA RUNOFF(CFS) =   10.46
  EFFECTIVE AREA(ACRES) =   4468.38   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =     5726.4       PEAK FLOW RATE(CFS) =    4786.92
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
```

HZ-31115

```
  MAINLINE Tc(MIN.) =   48.79
  *  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
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.50      0.30      1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        8.20      0.30      0.900    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.906
  SUBAREA AREA(ACRES) =    8.70      SUBAREA RUNOFF(CFS) =    8.28
  EFFECTIVE AREA(ACRES) =   4477.08   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =     5735.1       PEAK FLOW RATE(CFS) =    4786.92
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 1 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 3A00EV.DNA
  MEMORY BANK #  1 DEFINED AS FOLLOWS:
   STREAM       Q      Tc      Fp(Fm)      Ap     Ae      HEADWATER
   NUMBER     (CFS)  (MIN.)   (INCH/HR)          (ACRES)    NODE
      1     1020.74   13.66  0.30( 0.13) 0.43     436.0     120.00
      2     1020.32   13.79  0.30( 0.13) 0.43     438.2     110.00
      3      923.35   20.64  0.30( 0.13) 0.43     504.4     100.00
```



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      4      867.79   23.28  0.30( 0.13) 0.43     510.2     150.00
    TOTAL AREA(ACRES) =      510.2

****************************************************************************
  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     4103.92   33.60    1.641  0.30( 0.26) 0.85     2894.3    31100.00
      2     4768.80   47.09    1.356  0.30( 0.25) 0.84     4335.3    13210.00
      3     4786.72   47.60    1.347  0.30( 0.25) 0.84     4387.2    13200.00
      4     4786.92   48.79    1.329  0.30( 0.25) 0.84     4477.1    13100.00
      5     4401.50   72.85    1.059  0.30( 0.25) 0.83     5715.2    13000.00
      6     4307.49   75.17    1.040  0.30( 0.25) 0.83     5735.1    13010.00
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.00 =   41886.54 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     1020.74   13.66    2.731  0.30( 0.13) 0.43      436.0     120.00
      2     1020.32   13.79    2.717  0.30( 0.13) 0.43      438.2     110.00
      3      923.35   20.64    2.162  0.30( 0.13) 0.43      504.4     100.00
      4      867.79   23.28    2.020  0.30( 0.13) 0.43      510.2     150.00
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE  13305.00 =    9867.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1     4001.54   13.66    2.731  0.30( 0.22) 0.74     1612.5     120.00
      2     4011.40   13.79    2.717  0.30( 0.22) 0.74     1625.5     110.00
      3     4392.21   20.64    2.162  0.30( 0.23) 0.76     2282.1     100.00
      4     4487.98   23.28    2.020  0.30( 0.23) 0.77     2514.9     150.00
      5     4797.63   33.60    1.641  0.30( 0.24) 0.79     3404.5    31100.00
      6     5331.56   47.09    1.356  0.30( 0.24) 0.80     4845.5    13210.00
      7     5345.68   47.60    1.347  0.30( 0.24) 0.80     4897.4    13200.00
      8     5337.27   48.79    1.329  0.30( 0.24) 0.80     4987.3    13100.00
      9     4827.99   72.85    1.059  0.30( 0.24) 0.80     6225.4    13000.00
     10     4725.46   75.17    1.040  0.30( 0.24) 0.80     6245.3    13010.00
    TOTAL AREA(ACRES) =      6245.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     5345.68  Tc(MIN.) =   47.597
  EFFECTIVE AREA(ACRES) =   4897.40  AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.76
  TOTAL AREA(ACRES) =     6245.3
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13305.00 =   41886.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13305.00 TO NODE  13305.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
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 FLOW PROCESS FROM NODE  13305.00 TO NODE  13306.00 IS CODE =  56
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    315.00  DOWNSTREAM(FEET) =    245.50
 CHANNEL LENGTH THRU SUBAREA(FEET) =  4408.41   CHANNEL SLOPE =  0.0158
 GIVEN CHANNEL BASE(FEET) =   50.00   CHANNEL FREEBOARD(FEET) =  0.0
 "Z" FACTOR =   3.000   MANNING'S FACTOR = 0.040
 *ESTIMATED CHANNEL HEIGHT(FEET) =   6.05
 *  25 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
 PUBLIC PARK                B       68.77      0.30     0.850    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.850
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    5376.93
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  13.03
 AVERAGE FLOW DEPTH(FEET) =   6.05   TRAVEL TIME(MIN.) =   5.64
 Tc(MIN.) =   53.23
 SUBAREA AREA(ACRES) =    68.77       SUBAREA RUNOFF(CFS) =   62.49
 EFFECTIVE AREA(ACRES) =   4966.17     AREA-AVERAGED Fm(INCH/HR) =   0.24
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.80
 TOTAL AREA(ACRES) =     6314.1         PEAK FLOW RATE(CFS) =    5345.68
 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) =   6.03

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  6.03   FLOW VELOCITY(FEET/SEC.) =  13.01
 LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13306.00 =   46294.95 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  13306.00 TO NODE  13306.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   53.23
 *  25 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
 NATURAL POOR COVER
 "BARREN"                   B       21.50      0.30     1.000    86
 COMMERCIAL                 B       15.30      0.30     0.100    56
 NATURAL FAIR COVER
 "GRASS"                    B        0.80      0.30     1.000    69
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 B        0.60      0.30     1.000    65
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B        8.00      0.30     0.900    56
 NATURAL FAIR COVER
 "WOODLAND,GRASS"           B        0.10      0.30     1.000    65
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.685
 SUBAREA AREA(ACRES) =   46.30      SUBAREA RUNOFF(CFS) =   44.13
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 EFFECTIVE AREA(ACRES) =   5012.47   AREA-AVERAGED Fm(INCH/HR) =  0.24
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.80
 TOTAL AREA(ACRES) =     6360.4       PEAK FLOW RATE(CFS) =    5345.68
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE  13306.00 TO NODE  13306.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   53.23
 *  25 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
 NATURAL POOR COVER
 "BARREN"                   B       43.30      0.30     1.000    86
 COMMERCIAL                 B        4.90      0.30     0.100    56
 NATURAL FAIR COVER
 "GRASS"                    B        5.70      0.30     1.000    69
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 B        0.50      0.30     1.000    65
 PUBLIC PARK                B        1.10      0.30     0.850    56
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B        3.10      0.30     0.900    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.917
 SUBAREA AREA(ACRES) =   58.60      SUBAREA RUNOFF(CFS) =   52.20
 EFFECTIVE AREA(ACRES) =   5071.07   AREA-AVERAGED Fm(INCH/HR) =  0.24
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.80
 TOTAL AREA(ACRES) =     6419.0       PEAK FLOW RATE(CFS) =    5345.68
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE  13306.00 TO NODE  13306.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   53.23
 *  25 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
 NATURAL FAIR COVER
 "WOODLAND,GRASS"           B        6.80      0.30     1.000    65
 NATURAL POOR COVER
 "BARREN"                   B        0.70      0.30     1.000    86
 COMMERCIAL                 B        1.10      0.30     0.100    56
 NATURAL FAIR COVER
 "GRASS"                    B        0.50      0.30     1.000    69
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 B        0.10      0.30     1.000    65
 PUBLIC PARK                B        0.50      0.30     0.850    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.890
 SUBAREA AREA(ACRES) =    9.70      SUBAREA RUNOFF(CFS) =    8.71
 EFFECTIVE AREA(ACRES) =   5080.77   AREA-AVERAGED Fm(INCH/HR) =  0.24
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.80
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  TOTAL AREA(ACRES) =     6428.7       PEAK FLOW RATE(CFS) =    5345.68
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13306.00 TO NODE  13306.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   53.23
  *  25 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
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        2.20      0.30     0.900    56
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.10      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.904
  SUBAREA AREA(ACRES) =    2.30      SUBAREA RUNOFF(CFS) =    2.06
  EFFECTIVE AREA(ACRES) =   5083.07   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.80
  TOTAL AREA(ACRES) =     6431.0       PEAK FLOW RATE(CFS) =    5345.68
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  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) =   5.95
  CHANNEL FLOW THRU SUBAREA(CFS) =    5345.68
  FLOW VELOCITY(FEET/SEC.) =  13.23   FLOW DEPTH(FEET) =   5.95
  TRAVEL TIME(MIN.) =   1.94   Tc(MIN.) =   55.18
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13307.00 =   47838.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13307.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   55.18
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.239
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.20      0.30     0.100    56
  NATURAL FAIR COVER
  "GRASS"                    B        0.10      0.30     1.000    69
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        0.20      0.30     1.000    65
  NATURAL POOR COVER
  "BARREN"                   B        3.70      0.30     1.000    86
```

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  COMMERCIAL                 B        0.30      0.30     0.100    56
  NATURAL FAIR COVER
  "GRASS"                    B        3.20      0.30     1.000    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.942
  SUBAREA AREA(ACRES) =    7.70      SUBAREA RUNOFF(CFS) =    6.63
  EFFECTIVE AREA(ACRES) =   5090.77   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.80
  TOTAL AREA(ACRES) =     6438.7       PEAK FLOW RATE(CFS) =    5345.68
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13307.00 TO NODE  13307.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   55.18
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.239
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        3.60      0.30     1.000    65
  NATURAL FAIR COVER
  "GRASS"                    B        1.90      0.30     1.000    69
  NATURAL FAIR COVER
  "WOODLAND,GRASS"           B        0.60      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =    6.10      SUBAREA RUNOFF(CFS) =    5.16
  EFFECTIVE AREA(ACRES) =   5096.87   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.80
  TOTAL AREA(ACRES) =     6444.8       PEAK FLOW RATE(CFS) =    5345.68
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  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) =   7.11
  CHANNEL FLOW THRU SUBAREA(CFS) =    5345.68
  FLOW VELOCITY(FEET/SEC.) =  10.55   FLOW DEPTH(FEET) =   7.11
  TRAVEL TIME(MIN.) =   1.46   Tc(MIN.) =   56.64
  LONGEST FLOWPATH FROM NODE  13010.00 TO NODE  13308.00 =   48763.78 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   56.64
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.221
```

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SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "GRASS"	B	0.10	0.30	1.000	69
NATURAL FAIR COVER "OPEN BRUSH"	B	0.20	0.30	1.000	66
NATURAL FAIR COVER "WOODLAND,GRASS"	B	5.00	0.30	1.000	65
COMMERCIAL	B	3.20	0.30	0.100	56
NATURAL FAIR COVER "GRASS"	B	0.10	0.30	1.000	69
NATURAL FAIR COVER "OPEN BRUSH"	B	0.90	0.30	1.000	66

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.697
SUBAREA AREA(ACRES) = 9.50 SUBAREA RUNOFF(CFS) = 8.65
EFFECTIVE AREA(ACRES) = 5106.37 AREA-AVERAGED Fm(INCH/HR) = 0.24
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.80
TOTAL AREA(ACRES) = 6454.3 PEAK FLOW RATE(CFS) = 5345.68
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 56.64
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.221

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SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
APARTMENTS	B	0.30	0.30	0.200	56
NATURAL POOR COVER "BARREN"	B	0.20	0.30	1.000	86
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	B	1.00	0.30	1.000	63
COMMERCIAL	B	41.90	0.30	0.100	56
NATURAL FAIR COVER "GRASS"	B	7.20	0.30	1.000	69
NATURAL FAIR COVER "OPEN BRUSH"	B	25.00	0.30	1.000	66

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.498
SUBAREA AREA(ACRES) = 75.60 SUBAREA RUNOFF(CFS) = 72.91
EFFECTIVE AREA(ACRES) = 5181.97 AREA-AVERAGED Fm(INCH/HR) = 0.24
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.79
TOTAL AREA(ACRES) = 6529.9 PEAK FLOW RATE(CFS) = 5345.68
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 56.64
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.221
SUBAREA LOSS RATE DATA(AMC II):

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DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	B	0.10	0.30	0.850	56
AGRICULTURAL POOR COVER "ROW CROPS,CONTOURED"	B	0.90	0.30	1.000	79
SCHOOL	B	0.30	0.30	0.600	56
NATURAL FAIR COVER "WOODLAND,GRASS"	B	13.20	0.30	1.000	65
APARTMENTS	B	0.50	0.30	0.200	56
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	B	0.60	0.30	1.000	63

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.966
SUBAREA AREA(ACRES) = 15.60 SUBAREA RUNOFF(CFS) = 13.08
EFFECTIVE AREA(ACRES) = 5197.57 AREA-AVERAGED Fm(INCH/HR) = 0.24
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.79
TOTAL AREA(ACRES) = 6545.5 PEAK FLOW RATE(CFS) = 5345.68
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 56.64
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.221

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SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	33.90	0.30	0.100	56
NATURAL FAIR COVER "GRASS"	B	17.60	0.30	1.000	69
NATURAL FAIR COVER "OPEN BRUSH"	B	16.80	0.30	1.000	66
RESIDENTIAL "11+ DWELLINGS/ACRE"	B	0.60	0.30	0.200	56
RESIDENTIAL "8-10 DWELLINGS/ACRE"	B	1.50	0.30	0.400	56
AGRICULTURAL POOR COVER "ROW CROPS,CONTOURED"	B	10.00	0.30	1.000	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.603
SUBAREA AREA(ACRES) = 80.40 SUBAREA RUNOFF(CFS) = 75.26
EFFECTIVE AREA(ACRES) = 5277.97 AREA-AVERAGED Fm(INCH/HR) = 0.24
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.79
TOTAL AREA(ACRES) = 6625.9 PEAK FLOW RATE(CFS) = 5345.68
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
MAINLINE Tc(MIN.) = 56.64
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.221
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN

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  SCHOOL                    B        0.30      0.30     0.600    56
  NATURAL FAIR COVER
  "WOODLAND,GRASS"          B        0.70      0.30     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.880
  SUBAREA AREA(ACRES) =    1.00      SUBAREA RUNOFF(CFS) =    0.86
  EFFECTIVE AREA(ACRES) =   5278.97   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.79
  TOTAL AREA(ACRES) =     6626.9       PEAK FLOW RATE(CFS) =    5345.68
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   56.64
  *  25 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
  NATURAL FAIR COVER
  "GRASS"                   B        0.30      0.30     1.000    69
  NATURAL FAIR COVER
  "WOODLAND,GRASS"          B        0.80      0.30     1.000    65
  NATURAL FAIR COVER
  "GRASS"                   B        0.50      0.30     1.000    69
  NATURAL FAIR COVER
  "WOODLAND,GRASS"          B        0.20      0.30     1.000    65
  NATURAL FAIR COVER
  "GRASS"                   B        0.30      0.30     1.000    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =    2.10      SUBAREA RUNOFF(CFS) =    1.74
  EFFECTIVE AREA(ACRES) =   5281.07   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.79
  TOTAL AREA(ACRES) =     6629.0       PEAK FLOW RATE(CFS) =    5345.68
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE  13308.00 TO NODE  13308.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   56.64
  *  25 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
  NATURAL FAIR COVER
  "GRASS"                   B        1.20      0.30     1.000    69
  NATURAL FAIR COVER
  "OPEN BRUSH"              B        0.50      0.30     1.000    66
  PUBLIC PARK               B        1.70      0.30     0.850    56
  NATURAL FAIR COVER
  "WOODLAND,GRASS"          B        7.20      0.30     1.000    65
  NATURAL FAIR COVER
  "GRASS"                   B        1.00      0.30     1.000    69
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HZ-31010.2

HZ-31113.2


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  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.978
  SUBAREA AREA(ACRES) =   11.60      SUBAREA RUNOFF(CFS) =    9.68
  EFFECTIVE AREA(ACRES) =   5292.67   AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.79
  TOTAL AREA(ACRES) =     6640.6       PEAK FLOW RATE(CFS) =    5345.68
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =     6640.6  TC(MIN.) =     56.64
  EFFECTIVE AREA(ACRES) =   5292.67  AREA-AVERAGED Fm(INCH/HR)=  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.791
  PEAK FLOW RATE(CFS)   =    5345.68

  ** PEAK FLOW RATE TABLE **
   STREAM       Q       Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1     4001.54   23.53    2.008  0.30( 0.22) 0.74    2007.8     120.00
      2     4011.40   23.65    2.002  0.30( 0.22) 0.74    2020.8     110.00
      3     4392.21   30.23    1.742  0.30( 0.23) 0.75    2677.3     100.00
      4     4487.98   32.81    1.663  0.30( 0.23) 0.76    2910.2     150.00
      5     4797.63   42.95    1.428  0.30( 0.23) 0.78    3799.8   31100.00
      6     5331.56   56.14    1.227  0.30( 0.24) 0.79    5240.8   13210.00
      7     5345.68   56.64    1.221  0.30( 0.24) 0.79    5292.7   13200.00
      8     5337.27   57.84    1.207  0.30( 0.24) 0.79    5382.6   13100.00
      9     4827.99   82.18    0.989  0.30( 0.24) 0.79    6620.7   13000.00
     10     4725.46   84.56    0.973  0.30( 0.24) 0.79    6640.6   13010.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```