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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:

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FILE NAME: S38.DAT  
TIME/DATE OF STUDY: 09:38 09/12/2017  
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--\*TIME-OF-CONCENTRATION MODEL\*--  
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FLOW PROCESS FROM NODE 13803.00 TO NODE 13803.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<<  
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PEAK FLOWRATE TABLE FILE NAME: S37.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26040.46	24.70	0.30 ( 0.29)	0.97	5305.5	10300.00
2	27636.09	31.23	0.30 ( 0.29)	0.97	7256.7	10400.00
3	29366.53	37.96	0.30 ( 0.29)	0.97	9583.8	20700.00
4	31387.72	46.40	0.30 ( 0.29)	0.97	12898.6	10100.00
5	33159.96	53.97	0.30 ( 0.29)	0.97	16542.4	20300.00
6	34957.56	66.48	0.30 ( 0.29)	0.97	22801.7	31400.00
7	36167.37	77.43	0.30 ( 0.29)	0.97	28289.4	13100.00
8	37073.34	83.96	0.30 ( 0.29)	0.97	31162.1	11801.00
9	38784.54	94.44	0.30 ( 0.29)	0.97	36480.0	11530.00
10	39419.15	99.91	0.30 ( 0.29)	0.97	39974.4	13510.00
11	41111.13	112.77	0.30 ( 0.29)	0.97	48116.5	11350.00
12	41451.50	117.43	0.30 ( 0.29)	0.97	51289.6	11130.00
13	40984.34	123.54	0.30 ( 0.29)	0.97	54216.7	12300.00
14	40135.55	132.37	0.30 ( 0.29)	0.98	58477.3	12400.00
15	39024.14	141.97	0.30 ( 0.29)	0.98	61878.8	12201.00
16	38007.93	149.52	0.30 ( 0.29)	0.98	63771.3	12231.00
17	36954.24	157.09	0.30 ( 0.29)	0.98	65325.4	10400.00
18	35336.32	166.65	0.30 ( 0.29)	0.98	66770.6	12010.00
19	34268.07	172.14	0.30 ( 0.29)	0.98	67034.2	10210.00
20	29757.93	203.00	0.30 ( 0.29)	0.98	67793.9	10100.00

TOTAL AREA (ACRES) = 67793.9

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FLOW PROCESS FROM NODE 13803.00 TO NODE 13803.00 IS CODE = 14.0  
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>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
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MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26040.46	24.70	0.30 ( 0.29)	0.97	5305.5	10300.00
2	27636.09	31.23	0.30 ( 0.29)	0.97	7256.7	10400.00
3	29366.53	37.96	0.30 ( 0.29)	0.97	9583.8	20700.00
4	31387.72	46.40	0.30 ( 0.29)	0.97	12898.6	10100.00
5	33159.96	53.97	0.30 ( 0.29)	0.97	16542.4	20300.00
6	34957.56	66.48	0.30 ( 0.29)	0.97	22801.7	31400.00
7	36167.37	77.43	0.30 ( 0.29)	0.97	28289.4	13100.00
8	37073.34	83.96	0.30 ( 0.29)	0.97	31162.1	11801.00
9	38784.54	94.44	0.30 ( 0.29)	0.97	36480.0	11530.00
10	39419.15	99.91	0.30 ( 0.29)	0.97	39974.4	13510.00
11	41111.13	112.77	0.30 ( 0.29)	0.97	48116.5	11350.00
12	41451.50	117.43	0.30 ( 0.29)	0.97	51289.6	11130.00
13	40984.34	123.54	0.30 ( 0.29)	0.97	54216.7	12300.00
14	40135.55	132.37	0.30 ( 0.29)	0.98	58477.3	12400.00
15	39024.14	141.97	0.30 ( 0.29)	0.98	61878.8	12201.00
16	38007.93	149.52	0.30 ( 0.29)	0.98	63771.3	12231.00
17	36954.24	157.09	0.30 ( 0.29)	0.98	65325.4	10400.00
18	35336.32	166.65	0.30 ( 0.29)	0.98	66770.6	12010.00

19 34268.07 172.14 0.30( 0.29) 0.98 67034.2 10210.00  
20 29757.93 203.00 0.30( 0.29) 0.98 67793.9 10100.00  
TOTAL AREA (ACRES) = 67793.9

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FLOW PROCESS FROM NODE 13803.00 TO NODE 13820.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 140.00 DOWNSTREAM(FEET) = 137.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 926.91 CHANNEL SLOPE = 0.0032  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 16.90  
\* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 0.767  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 53.70 0.30 0.983 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.983  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 41462.90  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.64  
AVERAGE FLOW DEPTH(FEET) = 16.90 TRAVEL TIME(MIN.) = 1.06  
Tc(MIN.) = 118.49

SUBAREA AREA(ACRES) = 53.70 SUBAREA RUNOFF(CFS) = 22.80  
EFFECTIVE AREA(ACRES) = 51343.27 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA(ACRES) = 67847.6 PEAK FLOW RATE(CFS) = 41451.50  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 16.90

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 16.90 FLOW VELOCITY(FEET/SEC.) = 14.63  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13820.00 = 131542.94 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26040.46	25.90	1.693	0.30( 0.29)	0.97	5359.2	10300.00
2	27636.09	32.41	1.474	0.30( 0.29)	0.97	7310.4	10400.00
3	29366.53	39.13	1.339	0.30( 0.29)	0.97	9637.5	20700.00
4	31387.72	47.54	1.206	0.30( 0.29)	0.97	12952.3	10100.00
5	33159.96	55.09	1.105	0.30( 0.29)	0.97	16596.1	20300.00
6	34957.56	67.59	1.000	0.30( 0.29)	0.97	22855.4	31400.00
7	36167.37	78.53	0.938	0.30( 0.29)	0.97	28343.1	13100.00
8	37073.34	85.05	0.901	0.30( 0.29)	0.97	31215.8	11801.00
9	38784.54	95.51	0.852	0.30( 0.29)	0.97	36533.7	11530.00
10	39419.15	100.98	0.832	0.30( 0.29)	0.97	40028.1	13510.00
11	41111.13	113.82	0.784	0.30( 0.29)	0.97	48170.2	11350.00
12	41451.50	118.49	0.767	0.30( 0.29)	0.97	51343.3	11130.00
13	40984.34	124.60	0.751	0.30( 0.29)	0.97	54270.4	12300.00
14	40135.55	133.44	0.732	0.30( 0.29)	0.98	58531.0	12400.00
15	39024.14	143.04	0.711	0.30( 0.29)	0.98	61932.5	12201.00
16	38007.93	150.60	0.695	0.30( 0.29)	0.98	63825.0	12231.00

17 36954.24 158.18 0.679 0.30( 0.29) 0.98 65379.1 10400.00  
18 35336.32 167.76 0.658 0.30( 0.29) 0.98 66824.3 12010.00  
19 34268.07 173.25 0.647 0.30( 0.29) 0.98 67087.9 10210.00  
20 29757.93 204.16 0.609 0.30( 0.29) 0.98 67847.6 10100.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 41451.50 Tc(MIN.) = 118.49  
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 51343.27

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FLOW PROCESS FROM NODE 13803.00 TO NODE 13820.00 IS CODE = 1

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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

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TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 118.49  
RAINFALL INTENSITY(INCH/HR) = 0.77  
AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.97  
EFFECTIVE STREAM AREA(ACRES) = 51343.27  
TOTAL STREAM AREA(ACRES) = 67847.55  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 41451.50

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FLOW PROCESS FROM NODE 13810.00 TO NODE 13811.00 IS CODE = 21

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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

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INITIAL SUBAREA FLOW-LENGTH(FEET) = 648.54  
ELEVATION DATA: UPSTREAM(FEET) = 756.46 DOWNSTREAM(FEET) = 586.02

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.293  
\* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.775  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 5.58 0.30 1.000 0 12.29  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 12.43  
TOTAL AREA(ACRES) = 5.58 PEAK FLOW RATE(CFS) = 12.43

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FLOW PROCESS FROM NODE 13811.00 TO NODE 13811.50 IS CODE = 56

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 586.02 DOWNSTREAM(FEET) = 437.69  
CHANNEL LENGTH THRU SUBAREA(FEET) = 696.28 CHANNEL SLOPE = 0.2130  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.43



\* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.497  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 14.79 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 27.10  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.00  
 AVERAGE FLOW DEPTH (FEET) = 0.42 TRAVEL TIME (MIN.) = 1.93  
 Tc (MIN.) = 14.23  
 SUBAREA AREA (ACRES) = 14.79 SUBAREA RUNOFF (CFS) = 29.25  
 EFFECTIVE AREA (ACRES) = 20.37 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 20.4 PEAK FLOW RATE (CFS) = 40.28  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.53  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.53 FLOW VELOCITY (FEET/SEC.) = 6.88  
 LONGEST FLOWPATH FROM NODE 13810.00 TO NODE 13811.50 = 1344.82 FEET.

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 FLOW PROCESS FROM NODE 13811.50 TO NODE 13812.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
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ELEVATION DATA: UPSTREAM (FEET) = 437.69 DOWNSTREAM (FEET) = 402.36  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 681.04 CHANNEL SLOPE = 0.0519  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.99  
 \* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.261  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 18.41 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 56.54  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.91  
 AVERAGE FLOW DEPTH (FEET) = 0.97 TRAVEL TIME (MIN.) = 2.31  
 Tc (MIN.) = 16.54  
 SUBAREA AREA (ACRES) = 18.41 SUBAREA RUNOFF (CFS) = 32.50  
 EFFECTIVE AREA (ACRES) = 38.78 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 38.8 PEAK FLOW RATE (CFS) = 68.45  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.08

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.08 FLOW VELOCITY (FEET/SEC.) = 5.21  
 LONGEST FLOWPATH FROM NODE 13810.00 TO NODE 13812.00 = 2025.86 FEET.

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FLOW PROCESS FROM NODE 13812.00 TO NODE 13813.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
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ELEVATION DATA: UPSTREAM (FEET) = 402.36 DOWNSTREAM (FEET) = 259.72  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1282.56 CHANNEL SLOPE = 0.1112  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.03  
 \* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.027  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 27.87 0.30 0.858 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.858  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 90.67  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.39  
 AVERAGE FLOW DEPTH (FEET) = 1.02 TRAVEL TIME (MIN.) = 2.89  
 Tc (MIN.) = 19.43  
 SUBAREA AREA (ACRES) = 27.87 SUBAREA RUNOFF (CFS) = 44.38  
 EFFECTIVE AREA (ACRES) = 66.65 AREA-AVERAGED Fm (INCH/HR) = 0.28  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.94  
 TOTAL AREA (ACRES) = 66.7 PEAK FLOW RATE (CFS) = 104.66  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.11

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.11 FLOW VELOCITY (FEET/SEC.) = 7.72  
 LONGEST FLOWPATH FROM NODE 13810.00 TO NODE 13813.00 = 3308.42 FEET.

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 FLOW PROCESS FROM NODE 13813.00 TO NODE 13820.00 IS CODE = 31  
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>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<  
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ELEVATION DATA: UPSTREAM (FEET) = 259.72 DOWNSTREAM (FEET) = 137.00  
 FLOW LENGTH (FEET) = 2412.88 MANNING'S N = 0.013  
 ESTIMATED PIPE DIAMETER (INCH) INCREASED TO 36.000  
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 22.9 INCHES  
 PIPE-FLOW VELOCITY (FEET/SEC.) = 22.06  
 ESTIMATED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1  
 PIPE-FLOW (CFS) = 104.66  
 PIPE TRAVEL TIME (MIN.) = 1.82 Tc (MIN.) = 21.26  
 LONGEST FLOWPATH FROM NODE 13810.00 TO NODE 13820.00 = 5721.30 FEET.

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 FLOW PROCESS FROM NODE 13813.00 TO NODE 13820.00 IS CODE = 81  
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>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
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MAINLINE Tc (MIN.) = 21.26  
 \* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.918  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 82.54 0.30 0.570 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.570  
 SUBAREA AREA(ACRES) = 82.54 SUBAREA RUNOFF(CFS) = 129.77  
 EFFECTIVE AREA(ACRES) = 149.19 AREA-AVERAGED Fm(INCH/HR) = 0.22  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.74  
 TOTAL AREA(ACRES) = 149.2 PEAK FLOW RATE(CFS) = 227.89

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FLOW PROCESS FROM NODE 13813.00 TO NODE 13820.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

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TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 21.26  
 RAINFALL INTENSITY(INCH/HR) = 1.92  
 AREA-AVERAGED Fm(INCH/HR) = 0.22  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.74  
 EFFECTIVE STREAM AREA(ACRES) = 149.19  
 TOTAL STREAM AREA(ACRES) = 149.19  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 227.89

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26040.46	25.90	1.693	0.30( 0.29)	0.97	5359.2	10300.00
1	27636.09	32.41	1.474	0.30( 0.29)	0.97	7310.4	10400.00
1	29366.53	39.13	1.339	0.30( 0.29)	0.97	9637.5	20700.00
1	31387.72	47.54	1.206	0.30( 0.29)	0.97	12952.3	10100.00
1	33159.96	55.09	1.105	0.30( 0.29)	0.97	16596.1	20300.00
1	34957.56	67.59	1.000	0.30( 0.29)	0.97	22855.4	31400.00
1	36167.37	78.53	0.938	0.30( 0.29)	0.97	28343.1	13100.00
1	37073.34	85.05	0.901	0.30( 0.29)	0.97	31215.8	11801.00
1	38784.54	95.51	0.852	0.30( 0.29)	0.97	36533.7	11530.00
1	39419.15	100.98	0.832	0.30( 0.29)	0.97	40028.1	13510.00
1	41111.13	113.82	0.784	0.30( 0.29)	0.97	48170.2	11350.00
1	41451.50	118.49	0.767	0.30( 0.29)	0.97	51343.3	11130.00
1	40984.34	124.60	0.751	0.30( 0.29)	0.97	54270.4	12300.00
1	40135.55	133.44	0.732	0.30( 0.29)	0.98	58531.0	12400.00
1	39024.14	143.04	0.711	0.30( 0.29)	0.98	61932.5	12201.00
1	38007.93	150.60	0.695	0.30( 0.29)	0.98	63825.0	12231.00
1	36954.24	158.18	0.679	0.30( 0.29)	0.98	65379.1	10400.00
1	35336.32	167.76	0.658	0.30( 0.29)	0.98	66824.3	12010.00
1	34268.07	173.25	0.647	0.30( 0.29)	0.98	67087.9	10210.00
1	29757.93	204.16	0.609	0.30( 0.29)	0.98	67847.6	10100.00
2	227.89	21.26	1.918	0.30( 0.22)	0.74	149.2	13810.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25034.13	21.26	1.918	0.30( 0.29)	0.96	4547.6	13810.00

2	26238.12	25.90	1.693	0.30( 0.29)	0.97	5508.3	10300.00
3	27804.42	32.41	1.474	0.30( 0.29)	0.97	7459.6	10400.00
4	29516.64	39.13	1.339	0.30( 0.29)	0.97	9786.7	20700.00
5	31520.08	47.54	1.206	0.30( 0.29)	0.97	13101.5	10100.00
6	33278.68	55.09	1.105	0.30( 0.29)	0.97	16745.3	20300.00
7	35062.21	67.59	1.000	0.30( 0.29)	0.97	23004.5	31400.00
8	36263.69	78.53	0.938	0.30( 0.29)	0.96	28492.3	13100.00
9	37164.70	85.05	0.901	0.30( 0.29)	0.96	31364.9	11801.00
10	38869.37	95.51	0.852	0.30( 0.29)	0.97	36682.9	11530.00
11	39501.24	100.98	0.832	0.30( 0.29)	0.97	40177.3	13510.00
12	41186.79	113.82	0.784	0.30( 0.29)	0.97	48319.4	11350.00
13	41524.81	118.49	0.767	0.30( 0.29)	0.97	51492.5	11130.00
14	41055.57	124.60	0.751	0.30( 0.29)	0.97	54419.6	12300.00
15	40204.23	133.44	0.732	0.30( 0.29)	0.97	58680.2	12400.00
16	39090.04	143.04	0.711	0.30( 0.29)	0.97	62081.7	12201.00
17	38071.65	150.60	0.695	0.30( 0.29)	0.98	63974.2	12231.00
18	37015.78	158.18	0.679	0.30( 0.29)	0.98	65528.3	10400.00
19	35395.09	167.76	0.658	0.30( 0.29)	0.98	66973.5	12010.00
20	34325.25	173.25	0.647	0.30( 0.29)	0.98	67237.1	10210.00
21	29810.11	204.16	0.609	0.30( 0.29)	0.98	67996.7	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 41524.81 Tc(MIN.) = 118.49  
 EFFECTIVE AREA(ACRES) = 51492.46 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 67996.7  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13820.00 = 131542.94 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13820.00 TO NODE 13840.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 137.00 DOWNSTREAM(FEET) = 133.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1261.34 CHANNEL SLOPE = 0.0032  
 GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 17.01  
 \* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 0.761

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	31.60	0.30	0.683	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 41532.72  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.54  
 AVERAGE FLOW DEPTH(FEET) = 17.00 TRAVEL TIME(MIN.) = 1.45  
 Tc(MIN.) = 119.94  
 SUBAREA AREA(ACRES) = 31.60 SUBAREA RUNOFF(CFS) = 15.82  
 EFFECTIVE AREA(ACRES) = 51524.07 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 68028.3 PEAK FLOW RATE(CFS) = 41524.81  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 17.00

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH( FEET ) = 17.00 FLOW VELOCITY( FEET/SEC. ) = 14.54  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13840.00 = 132804.28 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25034.13	22.93	1.834	0.30 ( 0.29)	0.96	4579.2	13810.00
2	26238.12	27.55	1.624	0.30 ( 0.29)	0.96	5539.9	10300.00
3	27804.42	34.03	1.442	0.30 ( 0.29)	0.97	7491.2	10400.00
4	29516.64	40.72	1.310	0.30 ( 0.29)	0.97	9818.3	20700.00
5	31520.08	49.11	1.183	0.30 ( 0.29)	0.97	13133.1	10100.00
6	33278.68	56.63	1.085	0.30 ( 0.29)	0.97	16776.9	20300.00
7	35062.21	69.11	0.991	0.30 ( 0.29)	0.97	23036.1	31400.00
8	36263.69	80.03	0.929	0.30 ( 0.29)	0.96	28523.9	13100.00
9	37164.70	86.54	0.893	0.30 ( 0.29)	0.96	31396.5	11801.00
10	38869.37	96.98	0.847	0.30 ( 0.29)	0.97	36714.5	11530.00
11	39501.24	102.45	0.827	0.30 ( 0.29)	0.97	40208.9	13510.00
12	41186.79	115.27	0.779	0.30 ( 0.29)	0.97	48351.0	11350.00
13	41524.81	119.94	0.761	0.30 ( 0.29)	0.97	51524.1	11130.00
14	41055.57	126.05	0.748	0.30 ( 0.29)	0.97	54451.2	12300.00
15	40204.23	134.90	0.729	0.30 ( 0.29)	0.97	58711.8	12400.00
16	39090.04	144.51	0.708	0.30 ( 0.29)	0.97	62113.3	12201.00
17	38071.65	152.09	0.692	0.30 ( 0.29)	0.97	64005.8	12231.00
18	37015.78	159.68	0.676	0.30 ( 0.29)	0.98	65559.9	10400.00
19	35395.09	169.27	0.655	0.30 ( 0.29)	0.98	67005.1	12010.00
20	34325.25	174.78	0.643	0.30 ( 0.29)	0.98	67268.7	10210.00
21	29810.11	205.75	0.608	0.30 ( 0.29)	0.98	68028.3	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 41524.81 Tc(MIN.) = 119.94  
 AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 51524.07

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13820.00 TO NODE 13840.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

-----  
 TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 119.94  
 RAINFALL INTENSITY(INCH/HR) = 0.76  
 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.97  
 EFFECTIVE STREAM AREA(ACRES) = 51524.07  
 TOTAL STREAM AREA(ACRES) = 68028.34  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 41524.81

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13830.00 TO NODE 13831.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
 INITIAL SUBAREA FLOW-LENGTH( FEET ) = 744.71  
 ELEVATION DATA: UPSTREAM( FEET ) = 1100.95 DOWNSTREAM( FEET ) = 959.21

Tc = K\*(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.858  
 \* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.550  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
 NATURAL FAIR COVER  
 "CHAPARRAL,BROADLEAF" - 5.06 0.30 1.000 0 13.86  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 10.25  
 TOTAL AREA(ACRES) = 5.06 PEAK FLOW RATE(CFS) = 10.25

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13831.00 TO NODE 13832.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
 ELEVATION DATA: UPSTREAM( FEET ) = 959.21 DOWNSTREAM( FEET ) = 832.83  
 CHANNEL LENGTH THRU SUBAREA( FEET ) = 1076.71 CHANNEL SLOPE = 0.1174  
 GIVEN CHANNEL BASE( FEET ) = 10.00 CHANNEL FREEBOARD( FEET ) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT( FEET ) = 0.65  
 \* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.219

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 32.57 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 38.54  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC. ) = 5.60  
 AVERAGE FLOW DEPTH( FEET ) = 0.61 TRAVEL TIME(MIN.) = 3.21  
 Tc(MIN.) = 17.06  
 SUBAREA AREA(ACRES) = 32.57 SUBAREA RUNOFF(CFS) = 56.25  
 EFFECTIVE AREA(ACRES) = 37.63 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 37.6 PEAK FLOW RATE(CFS) = 64.99  
 GIVEN CHANNEL BASE( FEET ) = 10.00 CHANNEL FREEBOARD( FEET ) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT( FEET ) = 0.83

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH( FEET ) = 0.83 FLOW VELOCITY( FEET/SEC. ) = 6.73  
 LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13832.00 = 1821.42 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13832.00 TO NODE 13833.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
 ELEVATION DATA: UPSTREAM( FEET ) = 832.83 DOWNSTREAM( FEET ) = 572.49  
 CHANNEL LENGTH THRU SUBAREA( FEET ) = 1883.58 CHANNEL SLOPE = 0.1382  
 GIVEN CHANNEL BASE( FEET ) = 10.00 CHANNEL FREEBOARD( FEET ) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.97  
 \* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.928  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 32.23 0.30 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 88.65  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.85  
 AVERAGE FLOW DEPTH (FEET) = 0.95 TRAVEL TIME (MIN.) = 4.00  
 Tc (MIN.) = 21.06  
 SUBAREA AREA (ACRES) = 32.23 SUBAREA RUNOFF (CFS) = 47.22  
 EFFECTIVE AREA (ACRES) = 69.86 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 69.9 PEAK FLOW RATE (CFS) = 102.34  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.03

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.03 FLOW VELOCITY (FEET/SEC.) = 8.27  
 LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13833.00 = 3705.00 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13833.00 TO NODE 13834.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 572.49 DOWNSTREAM (FEET) = 471.65  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 943.78 CHANNEL SLOPE = 0.1068  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.23  
 \* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.829  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 27.51 0.30 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 121.28  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.01  
 AVERAGE FLOW DEPTH (FEET) = 1.22 TRAVEL TIME (MIN.) = 1.96  
 Tc (MIN.) = 23.03  
 SUBAREA AREA (ACRES) = 27.51 SUBAREA RUNOFF (CFS) = 37.86  
 EFFECTIVE AREA (ACRES) = 97.37 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 97.4 PEAK FLOW RATE (CFS) = 134.01  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.29

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.29 FLOW VELOCITY (FEET/SEC.) = 8.24  
 LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13834.00 = 4648.78 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13834.00 TO NODE 13835.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 471.65 DOWNSTREAM (FEET) = 347.06  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1647.45 CHANNEL SLOPE = 0.0756  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.77  
 \* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.673  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 94.21 0.30 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 192.28  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.18  
 AVERAGE FLOW DEPTH (FEET) = 1.74 TRAVEL TIME (MIN.) = 3.36  
 Tc (MIN.) = 26.38  
 SUBAREA AREA (ACRES) = 94.21 SUBAREA RUNOFF (CFS) = 116.41  
 EFFECTIVE AREA (ACRES) = 191.58 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 191.6 PEAK FLOW RATE (CFS) = 236.72  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.95

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.95 FLOW VELOCITY (FEET/SEC.) = 8.73  
 LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13835.00 = 6296.23 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13835.00 TO NODE 13836.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 347.06 DOWNSTREAM (FEET) = 269.29  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1696.71 CHANNEL SLOPE = 0.0458  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.88  
 \* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.531  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 233.25 0.30 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 366.16  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.28  
 AVERAGE FLOW DEPTH (FEET) = 2.83 TRAVEL TIME (MIN.) = 3.42  
 Tc (MIN.) = 29.80  
 SUBAREA AREA (ACRES) = 233.25 SUBAREA RUNOFF (CFS) = 258.52  
 EFFECTIVE AREA (ACRES) = 424.83 AREA-AVERAGED Fm (INCH/HR) = 0.30

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 424.8 PEAK FLOW RATE (CFS) = 470.85  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 3.22 FLOW VELOCITY (FEET/SEC.) = 8.89  
LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13836.00 = 7992.94 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13836.00 TO NODE 13837.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 269.29 DOWNSTREAM (FEET) = 191.87  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2529.21 CHANNEL SLOPE = 0.0306  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.86  
\* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.420

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 134.70 0.30 0.880 -

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.880

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 540.96

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.98

AVERAGE FLOW DEPTH (FEET) = 3.83 TRAVEL TIME (MIN.) = 5.28

Tc (MIN.) = 35.08

SUBAREA AREA (ACRES) = 134.70 SUBAREA RUNOFF (CFS) = 140.20

EFFECTIVE AREA (ACRES) = 559.53 AREA-AVERAGED Fm (INCH/HR) = 0.29

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97

TOTAL AREA (ACRES) = 559.5 PEAK FLOW RATE (CFS) = 568.63

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.93

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 3.93 FLOW VELOCITY (FEET/SEC.) = 8.09  
LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13837.00 = 10522.15 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13837.00 TO NODE 13840.00 IS CODE = 31  
-----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 191.87 DOWNSTREAM (FEET) = 133.00

FLOW LENGTH (FEET) = 1151.02 MANNING'S N = 0.013

DEPTH OF FLOW IN 63.0 INCH PIPE IS 46.4 INCHES

PIPE-FLOW VELOCITY (FEET/SEC.) = 33.24

ESTIMATED PIPE DIAMETER (INCH) = 63.00 NUMBER OF PIPES = 1

PIPE-FLOW (CFS) = 568.63

PIPE TRAVEL TIME (MIN.) = 0.58 Tc (MIN.) = 35.65

LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13840.00 = 11673.17 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13837.00 TO NODE 13840.00 IS CODE = 81  
-----

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

-----  
MAINLINE Tc (MIN.) = 35.65

\* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.409

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 5.97 0.30 0.622 -

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.622

SUBAREA AREA (ACRES) = 5.97 SUBAREA RUNOFF (CFS) = 6.57

EFFECTIVE AREA (ACRES) = 565.50 AREA-AVERAGED Fm (INCH/HR) = 0.29

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97

TOTAL AREA (ACRES) = 565.5 PEAK FLOW RATE (CFS) = 569.33

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13837.00 TO NODE 13840.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

-----  
TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION (MIN.) = 35.65

RAINFALL INTENSITY (INCH/HR) = 1.41

AREA-AVERAGED Fm (INCH/HR) = 0.29

AREA-AVERAGED Fp (INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.97

EFFECTIVE STREAM AREA (ACRES) = 565.50

TOTAL STREAM AREA (ACRES) = 565.50

PEAK FLOW RATE (CFS) AT CONFLUENCE = 569.33

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25034.13	22.93	1.834	0.30 ( 0.29)	0.96	4579.2	13810.00
1	26238.12	27.55	1.624	0.30 ( 0.29)	0.96	5539.9	10300.00
1	27804.42	34.03	1.442	0.30 ( 0.29)	0.97	7491.2	10400.00
1	29516.64	40.72	1.310	0.30 ( 0.29)	0.97	9818.3	20700.00
1	31520.08	49.11	1.183	0.30 ( 0.29)	0.97	13133.1	10100.00
1	33278.68	56.63	1.085	0.30 ( 0.29)	0.97	16776.9	20300.00
1	35062.21	69.11	0.991	0.30 ( 0.29)	0.97	23036.1	31400.00
1	36263.69	80.03	0.929	0.30 ( 0.29)	0.96	28523.9	13100.00
1	37164.70	86.54	0.893	0.30 ( 0.29)	0.96	31396.5	11801.00
1	38869.37	96.98	0.847	0.30 ( 0.29)	0.97	36714.5	11530.00
1	39501.24	102.45	0.827	0.30 ( 0.29)	0.97	40208.9	13510.00
1	41186.79	115.27	0.779	0.30 ( 0.29)	0.97	48351.0	11350.00
1	41524.81	119.94	0.761	0.30 ( 0.29)	0.97	51524.1	11130.00
1	41055.57	126.05	0.748	0.30 ( 0.29)	0.97	54451.2	12300.00
1	40204.23	134.90	0.729	0.30 ( 0.29)	0.97	58711.8	12400.00
1	39090.04	144.51	0.708	0.30 ( 0.29)	0.97	62113.3	12201.00
1	38071.65	152.09	0.692	0.30 ( 0.29)	0.97	64005.8	12231.00
1	37015.78	159.68	0.676	0.30 ( 0.29)	0.98	65559.9	10400.00
1	35395.09	169.27	0.655	0.30 ( 0.29)	0.98	67005.1	12010.00

1	34325.25	174.78	0.643	0.30 ( 0.29)	0.98	67268.7	10210.00
1	29810.11	205.75	0.608	0.30 ( 0.29)	0.98	68028.3	10100.00
2	569.33	35.65	1.409	0.30 ( 0.29)	0.97	565.5	13830.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25539.42	22.93	1.834	0.30 ( 0.29)	0.96	4942.8	13810.00
2	26762.85	27.55	1.624	0.30 ( 0.29)	0.96	5976.9	10300.00
3	28363.77	34.03	1.442	0.30 ( 0.29)	0.97	8031.0	10400.00
4	28788.73	35.65	1.409	0.30 ( 0.29)	0.97	8620.7	13830.00
5	30035.72	40.72	1.310	0.30 ( 0.29)	0.97	10383.8	20700.00
6	31974.28	49.11	1.183	0.30 ( 0.29)	0.97	13698.6	10100.00
7	33683.45	56.63	1.085	0.30 ( 0.29)	0.97	17342.4	20300.00
8	35419.10	69.11	0.991	0.30 ( 0.29)	0.97	23601.6	31400.00
9	36589.07	80.03	0.929	0.30 ( 0.29)	0.96	29089.4	13100.00
10	37471.31	86.54	0.893	0.30 ( 0.29)	0.96	31962.0	11801.00
11	39152.73	96.98	0.847	0.30 ( 0.29)	0.97	37280.0	11530.00
12	39774.22	102.45	0.827	0.30 ( 0.29)	0.97	40774.4	13510.00
13	41435.40	115.27	0.779	0.30 ( 0.29)	0.97	48916.5	11350.00
14	41764.56	119.94	0.761	0.30 ( 0.29)	0.97	52089.6	11130.00
15	41288.58	126.05	0.748	0.30 ( 0.29)	0.97	55016.7	12300.00
16	40427.56	134.90	0.729	0.30 ( 0.29)	0.97	59277.3	12400.00
17	39302.86	144.51	0.708	0.30 ( 0.29)	0.97	62678.8	12201.00
18	38276.17	152.09	0.692	0.30 ( 0.29)	0.97	64571.3	12231.00
19	37212.00	159.68	0.676	0.30 ( 0.29)	0.98	66125.4	10400.00
20	35580.81	169.27	0.655	0.30 ( 0.29)	0.98	67570.6	12010.00
21	34504.95	174.78	0.643	0.30 ( 0.29)	0.98	67834.2	10210.00
22	29971.71	205.75	0.608	0.30 ( 0.29)	0.98	68593.8	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 41764.56 Tc (MIN.) = 119.94  
EFFECTIVE AREA(ACRES) = 52089.57 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA(ACRES) = 68593.8  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13840.00 = 132804.28 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13840.00 TO NODE 13860.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 133.00 DOWNSTREAM(FEET) = 130.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 654.44 CHANNEL SLOPE = 0.0046  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 15.51  
\* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 0.760  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	6.61	0.30	0.975	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.975

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 41765.95  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.61  
AVERAGE FLOW DEPTH(FEET) = 15.51 TRAVEL TIME(MIN.) = 0.66  
Tc(MIN.) = 120.59  
SUBAREA AREA(ACRES) = 6.61 SUBAREA RUNOFF(CFS) = 2.78  
EFFECTIVE AREA(ACRES) = 52096.18 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA(ACRES) = 68600.5 PEAK FLOW RATE(CFS) = 41764.56  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 15.51

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 15.51 FLOW VELOCITY(FEET/SEC.) = 16.62  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13860.00 = 133458.72 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25539.42	23.68	1.796	0.30 ( 0.29)	0.96	4949.4	13810.00
2	26762.85	28.29	1.594	0.30 ( 0.29)	0.96	5983.5	10300.00
3	28363.77	34.77	1.427	0.30 ( 0.29)	0.97	8037.6	10400.00
4	28788.73	36.38	1.394	0.30 ( 0.29)	0.97	8627.3	13830.00
5	30035.72	41.44	1.299	0.30 ( 0.29)	0.97	10390.4	20700.00
6	31974.28	49.81	1.172	0.30 ( 0.29)	0.97	13705.2	10100.00
7	33683.45	57.33	1.077	0.30 ( 0.29)	0.97	17349.0	20300.00
8	35419.10	69.79	0.987	0.30 ( 0.29)	0.97	23608.3	31400.00
9	36589.07	80.72	0.926	0.30 ( 0.29)	0.96	29096.0	13100.00
10	37471.31	87.22	0.889	0.30 ( 0.29)	0.96	31968.7	11801.00
11	39152.73	97.65	0.844	0.30 ( 0.29)	0.97	37286.6	11530.00
12	39774.22	103.12	0.824	0.30 ( 0.29)	0.97	40781.0	13510.00
13	41435.40	115.93	0.776	0.30 ( 0.29)	0.97	48923.1	11350.00
14	41764.56	120.59	0.760	0.30 ( 0.29)	0.97	52096.2	11130.00
15	41288.58	126.71	0.747	0.30 ( 0.29)	0.97	55023.3	12300.00
16	40427.56	135.56	0.728	0.30 ( 0.29)	0.97	59283.9	12400.00
17	39302.86	145.18	0.707	0.30 ( 0.29)	0.97	62685.4	12201.00
18	38276.17	152.76	0.691	0.30 ( 0.29)	0.97	64577.9	12231.00
19	37212.00	160.35	0.674	0.30 ( 0.29)	0.98	66132.0	10400.00
20	35580.81	169.96	0.654	0.30 ( 0.29)	0.98	67577.2	12010.00
21	34504.95	175.47	0.642	0.30 ( 0.29)	0.98	67840.8	10210.00
22	29971.71	206.47	0.607	0.30 ( 0.29)	0.98	68600.5	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 41764.56 Tc(MIN.) = 120.59  
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 52096.18

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13840.00 TO NODE 13860.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 120.59  
RAINFALL INTENSITY(INCH/HR) = 0.76  
AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.97  
EFFECTIVE STREAM AREA (ACRES) = 52096.18  
TOTAL STREAM AREA (ACRES) = 68600.45  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 41764.56

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13850.00 TO NODE 13851.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH (FEET) = 617.57  
ELEVATION DATA: UPSTREAM (FEET) = 646.95 DOWNSTREAM (FEET) = 490.10

Tc = K \* [(LENGTH\*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20  
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 12.137  
\* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.797  
SUBAREA Tc AND LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL, BROADLEAF" - 4.95 0.30 1.000 0 12.14  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF (CFS) = 11.12  
TOTAL AREA (ACRES) = 4.95 PEAK FLOW RATE (CFS) = 11.12

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13851.00 TO NODE 13851.50 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM (FEET) = 490.10 DOWNSTREAM (FEET) = 440.98  
CHANNEL LENGTH THRU SUBAREA (FEET) = 351.14 CHANNEL SLOPE = 0.1399  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.34  
\* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.598

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 4.02 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 15.29  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.23  
AVERAGE FLOW DEPTH (FEET) = 0.34 TRAVEL TIME (MIN.) = 1.38  
Tc (MIN.) = 13.52  
SUBAREA AREA (ACRES) = 4.02 SUBAREA RUNOFF (CFS) = 8.32  
EFFECTIVE AREA (ACRES) = 8.97 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 9.0 PEAK FLOW RATE (CFS) = 18.56  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.38

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 0.38 FLOW VELOCITY (FEET/SEC.) = 4.58  
LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13851.50 = 968.71 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13851.50 TO NODE 13852.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM (FEET) = 440.98 DOWNSTREAM (FEET) = 395.76  
CHANNEL LENGTH THRU SUBAREA (FEET) = 512.91 CHANNEL SLOPE = 0.0882  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.53  
\* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.349

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 7.17 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 25.17  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.42  
AVERAGE FLOW DEPTH (FEET) = 0.52 TRAVEL TIME (MIN.) = 1.93  
Tc (MIN.) = 15.45  
SUBAREA AREA (ACRES) = 7.17 SUBAREA RUNOFF (CFS) = 13.22  
EFFECTIVE AREA (ACRES) = 16.14 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 16.1 PEAK FLOW RATE (CFS) = 29.77  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.57

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.57 FLOW VELOCITY (FEET/SEC.) = 4.69  
LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13852.00 = 1481.62 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13852.00 TO NODE 13853.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM (FEET) = 395.76 DOWNSTREAM (FEET) = 354.94  
CHANNEL LENGTH THRU SUBAREA (FEET) = 443.69 CHANNEL SLOPE = 0.0920  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.63  
\* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.230

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 6.76 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 35.64  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.04  
AVERAGE FLOW DEPTH (FEET) = 0.63 TRAVEL TIME (MIN.) = 1.47

Tc(MIN.) = 16.92  
SUBAREA AREA(ACRES) = 6.76 SUBAREA RUNOFF(CFS) = 11.74  
EFFECTIVE AREA(ACRES) = 22.90 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 22.9 PEAK FLOW RATE(CFS) = 39.79  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.67

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.67 FLOW VELOCITY(FEET/SEC.) = 5.25  
LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13853.00 = 1925.31 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13853.00 TO NODE 13854.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 354.94 DOWNSTREAM(FEET) = 263.57  
CHANNEL LENGTH THRU SUBAREA(FEET) = 962.09 CHANNEL SLOPE = 0.0950  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.81

\* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.009

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 18.16 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 53.77  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.87  
AVERAGE FLOW DEPTH(FEET) = 0.79 TRAVEL TIME(MIN.) = 2.73  
Tc(MIN.) = 19.65

SUBAREA AREA(ACRES) = 18.16 SUBAREA RUNOFF(CFS) = 27.94  
EFFECTIVE AREA(ACRES) = 41.06 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 41.1 PEAK FLOW RATE(CFS) = 63.16  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.87

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.87 FLOW VELOCITY(FEET/SEC.) = 6.21  
LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13854.00 = 2887.40 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13854.00 TO NODE 13855.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 263.57 DOWNSTREAM(FEET) = 188.74  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1228.77 CHANNEL SLOPE = 0.0609  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.23

\* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.828  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 38.75 0.30 0.879 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.879  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 90.46  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.02  
AVERAGE FLOW DEPTH(FEET) = 1.21 TRAVEL TIME(MIN.) = 3.40  
Tc(MIN.) = 23.06  
SUBAREA AREA(ACRES) = 38.75 SUBAREA RUNOFF(CFS) = 54.54  
EFFECTIVE AREA(ACRES) = 79.81 AREA-AVERAGED Fm(INCH/HR) = 0.28  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.94  
TOTAL AREA(ACRES) = 79.8 PEAK FLOW RATE(CFS) = 111.00  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.36

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.36 FLOW VELOCITY(FEET/SEC.) = 6.41  
LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13855.00 = 4116.17 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13855.00 TO NODE 13860.00 IS CODE = 31  
-----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 188.74 DOWNSTREAM(FEET) = 130.00  
FLOW LENGTH(FEET) = 2092.67 MANNING'S N = 0.013  
DEPTH OF FLOW IN 39.0 INCH PIPE IS 27.5 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 17.74  
ESTIMATED PIPE DIAMETER(INCH) = 39.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 111.00  
PIPE TRAVEL TIME(MIN.) = 1.97 Tc(MIN.) = 25.02  
LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13860.00 = 6208.84 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13855.00 TO NODE 13860.00 IS CODE = 81  
-----

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

=====

MAINLINE Tc(MIN.) = 25.02  
\* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.729  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 43.41 0.30 0.707 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.707  
SUBAREA AREA(ACRES) = 43.41 SUBAREA RUNOFF(CFS) = 59.27  
EFFECTIVE AREA(ACRES) = 123.22 AREA-AVERAGED Fm(INCH/HR) = 0.26  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.86  
TOTAL AREA(ACRES) = 123.2 PEAK FLOW RATE(CFS) = 163.19

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13855.00 TO NODE 13860.00 IS CODE = 1



-----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<  
 -----

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION (MIN.) = 25.02  
 RAINFALL INTENSITY (INCH/HR) = 1.73  
 AREA-AVERAGED Fm (INCH/HR) = 0.26  
 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.86  
 EFFECTIVE STREAM AREA (ACRES) = 123.22  
 TOTAL STREAM AREA (ACRES) = 123.22  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 163.19

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25539.42	23.68	1.796	0.30 ( 0.29)	0.96	4949.4	13810.00
1	26762.85	28.29	1.594	0.30 ( 0.29)	0.96	5983.5	10300.00
1	28363.77	34.77	1.427	0.30 ( 0.29)	0.97	8037.6	10400.00
1	28788.73	36.38	1.394	0.30 ( 0.29)	0.97	8627.3	13830.00
1	30035.72	41.44	1.299	0.30 ( 0.29)	0.97	10390.4	20700.00
1	31974.28	49.81	1.172	0.30 ( 0.29)	0.97	13705.2	10100.00
1	33683.45	57.33	1.077	0.30 ( 0.29)	0.97	17349.0	20300.00
1	35419.10	69.79	0.987	0.30 ( 0.29)	0.97	23608.3	31400.00
1	36589.07	80.72	0.926	0.30 ( 0.29)	0.96	29096.0	13100.00
1	37471.31	87.22	0.889	0.30 ( 0.29)	0.96	31968.7	11801.00
1	39152.73	97.65	0.844	0.30 ( 0.29)	0.97	37286.6	11530.00
1	39774.22	103.12	0.824	0.30 ( 0.29)	0.97	40781.0	13510.00
1	41435.40	115.93	0.776	0.30 ( 0.29)	0.97	48923.1	11350.00
1	41764.56	120.59	0.760	0.30 ( 0.29)	0.97	52096.2	11130.00
1	41288.58	126.71	0.747	0.30 ( 0.29)	0.97	55023.3	12300.00
1	40427.56	135.56	0.728	0.30 ( 0.29)	0.97	59283.9	12400.00
1	39302.86	145.18	0.707	0.30 ( 0.29)	0.97	62685.4	12201.00
1	38276.17	152.76	0.691	0.30 ( 0.29)	0.97	64577.9	12231.00
1	37212.00	160.35	0.674	0.30 ( 0.29)	0.98	66132.0	10400.00
1	35580.81	169.96	0.654	0.30 ( 0.29)	0.98	67577.2	12010.00
1	34504.95	175.47	0.642	0.30 ( 0.29)	0.98	67840.8	10210.00
1	29971.71	206.47	0.607	0.30 ( 0.29)	0.98	68600.5	10100.00
2	163.19	25.02	1.729	0.30 ( 0.26)	0.86	123.2	13850.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25700.92	23.68	1.796	0.30 ( 0.29)	0.96	5066.1	13810.00
2	26057.37	25.02	1.729	0.30 ( 0.29)	0.96	5372.5	13850.00
3	26911.01	28.29	1.594	0.30 ( 0.29)	0.96	6106.7	10300.00
4	28493.43	34.77	1.427	0.30 ( 0.29)	0.96	8160.8	10400.00
5	28914.77	36.38	1.394	0.30 ( 0.29)	0.97	8750.6	13830.00
6	30151.22	41.44	1.299	0.30 ( 0.29)	0.97	10513.6	20700.00
7	32075.67	49.81	1.172	0.30 ( 0.29)	0.97	13828.4	10100.00
8	33774.29	57.33	1.077	0.30 ( 0.29)	0.97	17472.2	20300.00
9	35500.05	69.79	0.987	0.30 ( 0.29)	0.97	23731.5	31400.00
10	36663.16	80.72	0.926	0.30 ( 0.29)	0.96	29219.2	13100.00

11	37541.31	87.22	0.889	0.30 ( 0.29)	0.96	32091.9	11801.00
12	39217.81	97.65	0.844	0.30 ( 0.29)	0.97	37409.8	11530.00
13	39837.04	103.12	0.824	0.30 ( 0.29)	0.97	40904.2	13510.00
14	41492.91	115.93	0.776	0.30 ( 0.29)	0.97	49046.3	11350.00
15	41820.25	120.59	0.760	0.30 ( 0.29)	0.97	52219.4	11130.00
16	41342.81	126.71	0.747	0.30 ( 0.29)	0.97	55146.5	12300.00
17	40479.68	135.56	0.728	0.30 ( 0.29)	0.97	59407.1	12400.00
18	39352.68	145.18	0.707	0.30 ( 0.29)	0.97	62808.6	12201.00
19	38324.19	152.76	0.691	0.30 ( 0.29)	0.97	64701.2	12231.00
20	37258.20	160.35	0.674	0.30 ( 0.29)	0.97	66255.2	10400.00
21	35624.73	169.96	0.654	0.30 ( 0.29)	0.98	67700.4	12010.00
22	34547.55	175.47	0.642	0.30 ( 0.29)	0.98	67964.0	10210.00
23	30010.46	206.47	0.607	0.30 ( 0.29)	0.98	68723.7	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 41820.25 Tc (MIN.) = 120.59  
 EFFECTIVE AREA (ACRES) = 52219.39 AREA-AVERAGED Fm (INCH/HR) = 0.29  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA (ACRES) = 68723.7  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13860.00 = 133458.72 FEET.

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FLOW PROCESS FROM NODE 13860.00 TO NODE 13880.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

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 ELEVATION DATA: UPSTREAM (FEET) = 130.00 DOWNSTREAM (FEET) = 120.57  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 610.77 CHANNEL SLOPE = 0.0154  
 GIVEN CHANNEL BASE (FEET) = 100.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 11.27  
 \* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 0.759  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCSSOIL AREA Fp Ap SCSS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 4.89 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 41821.27  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 25.59  
 AVERAGE FLOW DEPTH (FEET) = 11.27 TRAVEL TIME (MIN.) = 0.40  
 Tc (MIN.) = 120.99

SUBAREA AREA (ACRES) = 4.89 SUBAREA RUNOFF (CFS) = 2.02  
 EFFECTIVE AREA (ACRES) = 52224.29 AREA-AVERAGED Fm (INCH/HR) = 0.29  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA (ACRES) = 68728.6 PEAK FLOW RATE (CFS) = 41820.25  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 100.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 11.27

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 11.27 FLOW VELOCITY (FEET/SEC.) = 25.59  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13880.00 = 134069.48 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
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NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE
1	25700.92	24.15	1.773	0.30( 0.29)	0.96	5071.0 13810.00
2	26057.37	25.48	1.710	0.30( 0.29)	0.96	5377.4 13850.00
3	26911.01	28.75	1.575	0.30( 0.29)	0.96	6111.6 10300.00
4	28493.43	35.21	1.418	0.30( 0.29)	0.96	8165.7 10400.00
5	28914.77	36.83	1.385	0.30( 0.29)	0.97	8755.4 13830.00
6	30151.22	41.88	1.292	0.30( 0.29)	0.97	10518.5 20700.00
7	32075.67	50.24	1.166	0.30( 0.29)	0.97	13833.3 10100.00
8	33774.29	57.75	1.071	0.30( 0.29)	0.97	17477.1 20300.00
9	35500.05	70.21	0.985	0.30( 0.29)	0.97	23736.4 31400.00
10	36663.16	81.13	0.923	0.30( 0.29)	0.96	29224.1 13100.00
11	37541.31	87.63	0.886	0.30( 0.29)	0.96	32096.8 11801.00
12	39217.81	98.06	0.843	0.30( 0.29)	0.97	37414.7 11530.00
13	39837.04	103.52	0.823	0.30( 0.29)	0.97	40909.1 13510.00
14	41492.91	116.33	0.775	0.30( 0.29)	0.97	49051.2 11350.00
15	41820.25	120.99	0.759	0.30( 0.29)	0.97	52224.3 11130.00
16	41342.81	127.11	0.746	0.30( 0.29)	0.97	55151.4 12300.00
17	40479.68	135.96	0.727	0.30( 0.29)	0.97	59412.0 12400.00
18	39352.68	145.58	0.706	0.30( 0.29)	0.97	62813.5 12201.00
19	38324.19	153.17	0.690	0.30( 0.29)	0.97	64706.0 12231.00
20	37258.20	160.77	0.673	0.30( 0.29)	0.97	66260.1 10400.00
21	35624.73	170.38	0.653	0.30( 0.29)	0.98	67705.3 12010.00
22	34547.55	175.89	0.641	0.30( 0.29)	0.98	67968.9 10210.00
23	30010.46	206.91	0.607	0.30( 0.29)	0.98	68728.6 10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 41820.25 Tc(MIN.) = 120.99  
 AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 52224.29

\*\*\*\*\*

FLOW PROCESS FROM NODE 13860.00 TO NODE 13880.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 120.99  
 RAINFALL INTENSITY(INCH/HR) = 0.76  
 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.97  
 EFFECTIVE STREAM AREA(ACRES) = 52224.29  
 TOTAL STREAM AREA(ACRES) = 68728.56  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 41820.25

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FLOW PROCESS FROM NODE 13870.00 TO NODE 13871.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 872.65  
 ELEVATION DATA: UPSTREAM(FEET) = 558.52 DOWNSTREAM(FEET) = 436.47

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 15.704  
 \* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.329  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "GRASS"	-	9.32	0.30	1.000	0	15.70
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30						
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000						
SUBAREA RUNOFF(CFS) = 17.02						
TOTAL AREA(ACRES) = 9.32 PEAK FLOW RATE(CFS) = 17.02						

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FLOW PROCESS FROM NODE 13871.00 TO NODE 13872.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 436.47 DOWNSTREAM(FEET) = 337.62  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 827.95 CHANNEL SLOPE = 0.1194  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.52  
 \* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.111

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	14.27	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 28.67  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.12  
 AVERAGE FLOW DEPTH(FEET) = 0.51 TRAVEL TIME(MIN.) = 2.70  
 Tc(MIN.) = 18.40  
 SUBAREA AREA(ACRES) = 14.27 SUBAREA RUNOFF(CFS) = 23.26  
 EFFECTIVE AREA(ACRES) = 23.59 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 23.6 PEAK FLOW RATE(CFS) = 38.44  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.61

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.61 FLOW VELOCITY(FEET/SEC.) = 5.64  
 LONGEST FLOWPATH FROM NODE 13870.00 TO NODE 13872.00 = 1700.60 FEET.

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FLOW PROCESS FROM NODE 13872.00 TO NODE 13873.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 337.62 DOWNSTREAM(FEET) = 253.88  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1049.16 CHANNEL SLOPE = 0.0798  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.95  
 \* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.913

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	14.27	0.30	1.000	-

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USER-DEFINED          -      35.74      0.30      0.923      -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.923
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) =      64.79
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) =      5.90
AVERAGE FLOW DEPTH (FEET) = 0.93 TRAVEL TIME (MIN.) = 2.96
Tc (MIN.) = 21.36
SUBAREA AREA (ACRES) = 35.74 SUBAREA RUNOFF (CFS) = 52.62
EFFECTIVE AREA (ACRES) = 59.33 AREA-AVERAGED Fm (INCH/HR) = 0.29
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.95
TOTAL AREA (ACRES) = 59.3 PEAK FLOW RATE (CFS) = 86.86
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT (FEET) = 1.10

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH (FEET) = 1.10 FLOW VELOCITY (FEET/SEC.) = 6.50
LONGEST FLOWPATH FROM NODE 13870.00 TO NODE 13873.00 = 2749.76 FEET.

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FLOW PROCESS FROM NODE 13873.00 TO NODE 13874.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 253.88 DOWNSTREAM (FEET) = 160.73
CHANNEL LENGTH THRU SUBAREA (FEET) = 1518.60 CHANNEL SLOPE = 0.0613
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040

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*ESTIMATED CHANNEL HEIGHT (FEET) = 1.07
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.762
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS
LAND USE              GROUP  (ACRES)  (INCH/HR) (DECIMAL) CN
USER-DEFINED          -      32.43      0.30      0.900      -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.900
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 108.65
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.41
AVERAGE FLOW DEPTH (FEET) = 1.07 TRAVEL TIME (MIN.) = 3.01
Tc (MIN.) = 24.37
SUBAREA AREA (ACRES) = 32.43 SUBAREA RUNOFF (CFS) = 43.54
EFFECTIVE AREA (ACRES) = 91.76 AREA-AVERAGED Fm (INCH/HR) = 0.28
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.93
TOTAL AREA (ACRES) = 91.8 PEAK FLOW RATE (CFS) = 122.32
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT (FEET) = 1.14

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH (FEET) = 1.14 FLOW VELOCITY (FEET/SEC.) = 8.74
LONGEST FLOWPATH FROM NODE 13870.00 TO NODE 13874.00 = 4268.36 FEET.

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FLOW PROCESS FROM NODE 13874.00 TO NODE 13875.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 160.73 DOWNSTREAM (FEET) = 158.14
CHANNEL LENGTH THRU SUBAREA (FEET) = 582.74 CHANNEL SLOPE = 0.0044
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT (FEET) = 2.83
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.652
SUBAREA LOSS RATE DATA (AMC II):

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DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS
LAND USE              GROUP  (ACRES)  (INCH/HR) (DECIMAL) CN
USER-DEFINED          -      73.67      0.30      0.930      -

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SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.930
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 167.85
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.85
AVERAGE FLOW DEPTH (FEET) = 2.80 TRAVEL TIME (MIN.) = 2.52
Tc (MIN.) = 26.90
SUBAREA AREA (ACRES) = 73.67 SUBAREA RUNOFF (CFS) = 91.01
EFFECTIVE AREA (ACRES) = 165.43 AREA-AVERAGED Fm (INCH/HR) = 0.28
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.93
TOTAL AREA (ACRES) = 165.4 PEAK FLOW RATE (CFS) = 204.24
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040

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*ESTIMATED CHANNEL HEIGHT (FEET) = 3.10

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH (FEET) = 3.10 FLOW VELOCITY (FEET/SEC.) = 4.07
LONGEST FLOWPATH FROM NODE 13870.00 TO NODE 13875.00 = 4851.10 FEET.

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*****
FLOW PROCESS FROM NODE 13875.00 TO NODE 13880.00 IS CODE = 31
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>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 158.14 DOWNSTREAM (FEET) = 120.57
FLOW LENGTH (FEET) = 1855.67 MANNING'S N = 0.013
DEPTH OF FLOW IN 51.0 INCH PIPE IS 37.7 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) = 18.17
ESTIMATED PIPE DIAMETER (INCH) = 51.00 NUMBER OF PIPES = 1
PIPE-FLOW (CFS) = 204.24
PIPE TRAVEL TIME (MIN.) = 1.70 Tc (MIN.) = 28.60
LONGEST FLOWPATH FROM NODE 13870.00 TO NODE 13880.00 = 6706.77 FEET.

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FLOW PROCESS FROM NODE 13875.00 TO NODE 13880.00 IS CODE = 81
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>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<

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MAINLINE Tc (MIN.) = 28.60
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.581
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS
LAND USE              GROUP  (ACRES)  (INCH/HR) (DECIMAL) CN
USER-DEFINED          -      34.90      0.30      0.743      -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.743
SUBAREA AREA (ACRES) = 34.90 SUBAREA RUNOFF (CFS) = 42.66

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EFFECTIVE AREA(ACRES) = 200.33 AREA-AVERAGED Fm(INCH/HR) = 0.27  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.90  
 TOTAL AREA(ACRES) = 200.3 PEAK FLOW RATE(CFS) = 236.42

\*\*\*\*\*

FLOW PROCESS FROM NODE 13875.00 TO NODE 13880.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 28.60  
 RAINFALL INTENSITY(INCH/HR) = 1.58  
 AREA-AVERAGED Fm(INCH/HR) = 0.27  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.90  
 EFFECTIVE STREAM AREA(ACRES) = 200.33  
 TOTAL STREAM AREA(ACRES) = 200.33  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 236.42

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25700.92	24.15	1.773	0.30( 0.29)	0.96	5071.0	13810.00
1	26057.37	25.48	1.710	0.30( 0.29)	0.96	5377.4	13850.00
1	26911.01	28.75	1.575	0.30( 0.29)	0.96	6111.6	10300.00
1	28493.43	35.21	1.418	0.30( 0.29)	0.96	8165.7	10400.00
1	28914.77	36.83	1.385	0.30( 0.29)	0.97	8755.4	13830.00
1	30151.22	41.88	1.292	0.30( 0.29)	0.97	10518.5	20700.00
1	32075.67	50.24	1.166	0.30( 0.29)	0.97	13833.3	10100.00
1	33774.29	57.75	1.071	0.30( 0.29)	0.97	17477.1	20300.00
1	35500.05	70.21	0.985	0.30( 0.29)	0.97	23736.4	31400.00
1	36663.16	81.13	0.923	0.30( 0.29)	0.96	29224.1	13100.00
1	37541.31	87.63	0.886	0.30( 0.29)	0.96	32096.8	11801.00
1	39217.81	98.06	0.843	0.30( 0.29)	0.97	37414.7	11530.00
1	39837.04	103.52	0.823	0.30( 0.29)	0.97	40909.1	13510.00
1	41492.91	116.33	0.775	0.30( 0.29)	0.97	49051.2	11350.00
1	41820.25	120.99	0.759	0.30( 0.29)	0.97	52224.3	11130.00
1	41342.81	127.11	0.746	0.30( 0.29)	0.97	55151.4	12300.00
1	40479.68	135.96	0.727	0.30( 0.29)	0.97	59412.0	12400.00
1	39352.68	145.58	0.706	0.30( 0.29)	0.97	62813.5	12201.00
1	38324.19	153.17	0.690	0.30( 0.29)	0.97	64706.0	12231.00
1	37258.20	160.77	0.673	0.30( 0.29)	0.97	66260.1	10400.00
1	35624.73	170.38	0.653	0.30( 0.29)	0.98	67705.3	12010.00
1	34547.55	175.89	0.641	0.30( 0.29)	0.98	67968.9	10210.00
1	30010.46	206.91	0.607	0.30( 0.29)	0.98	68728.6	10100.00
2	236.42	28.60	1.581	0.30( 0.27)	0.90	200.3	13870.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25929.73	24.15	1.773	0.30( 0.29)	0.96	5240.1	13810.00
2	26288.74	25.48	1.710	0.30( 0.29)	0.96	5555.9	13850.00
3	27107.85	28.60	1.581	0.30( 0.29)	0.96	6277.9	13870.00

4	27146.29	28.75	1.575	0.30( 0.29)	0.96	6311.9	10300.00
5	28700.39	35.21	1.418	0.30( 0.29)	0.96	8366.1	10400.00
6	29115.84	36.83	1.385	0.30( 0.29)	0.96	8955.8	13830.00
7	30335.60	41.88	1.292	0.30( 0.29)	0.97	10718.9	20700.00
8	32237.24	50.24	1.166	0.30( 0.29)	0.97	14033.6	10100.00
9	33918.79	57.75	1.071	0.30( 0.29)	0.97	17677.4	20300.00
10	35629.02	70.21	0.985	0.30( 0.29)	0.97	23936.7	31400.00
11	36780.97	81.13	0.923	0.30( 0.29)	0.96	29424.4	13100.00
12	37652.48	87.63	0.886	0.30( 0.29)	0.96	32297.1	11801.00
13	39321.14	98.06	0.843	0.30( 0.29)	0.96	37615.0	11530.00
14	39936.70	103.52	0.823	0.30( 0.29)	0.97	41109.5	13510.00
15	41583.95	116.33	0.775	0.30( 0.29)	0.97	49251.5	11350.00
16	41908.43	120.99	0.759	0.30( 0.29)	0.97	52424.6	11130.00
17	41428.61	127.11	0.746	0.30( 0.29)	0.97	55351.8	12300.00
18	40562.06	135.96	0.727	0.30( 0.29)	0.97	59612.3	12400.00
19	39431.33	145.58	0.706	0.30( 0.29)	0.97	63013.8	12201.00
20	38399.89	153.17	0.690	0.30( 0.29)	0.97	64906.4	12231.00
21	37330.96	160.77	0.673	0.30( 0.29)	0.97	66460.4	10400.00
22	35693.76	170.38	0.653	0.30( 0.29)	0.98	67905.7	12010.00
23	34614.45	175.89	0.641	0.30( 0.29)	0.98	68169.2	10210.00
24	30071.18	206.91	0.607	0.30( 0.29)	0.98	68928.9	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 41908.43 Tc(MIN.) = 120.99  
 EFFECTIVE AREA(ACRES) = 52424.61 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 68928.9  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13880.00 = 134069.48 FEET.

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FLOW PROCESS FROM NODE 13880.00 TO NODE 13910.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 120.57 DOWNSTREAM(FEET) = 119.70  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1190.21 CHANNEL SLOPE = 0.0007  
 GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 24.67  
 \* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 0.754

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	117.69	0.30	0.724	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.724

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 41936.86  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.56

AVERAGE FLOW DEPTH(FEET) = 24.67 TRAVEL TIME(MIN.) = 2.32  
 Tc(MIN.) = 123.31

SUBAREA AREA(ACRES) = 117.69 SUBAREA RUNOFF(CFS) = 56.85  
 EFFECTIVE AREA(ACRES) = 52542.30 AREA-AVERAGED Fm(INCH/HR) = 0.29

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 69046.6 PEAK FLOW RATE(CFS) = 41908.43

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT (FEET) = 24.66

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 24.66 FLOW VELOCITY (FEET/SEC.) = 8.55

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13910.00 = 135259.69 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25929.73	26.78	1.656	0.30 ( 0.29)	0.95	5357.8	13810.00
2	26288.74	28.11	1.601	0.30 ( 0.29)	0.95	5673.6	13850.00
3	27107.85	31.21	1.499	0.30 ( 0.29)	0.96	6395.6	13870.00
4	27146.29	31.36	1.496	0.30 ( 0.29)	0.96	6429.6	10300.00
5	28700.39	37.78	1.366	0.30 ( 0.29)	0.96	8483.8	10400.00
6	29115.84	39.39	1.333	0.30 ( 0.29)	0.96	9073.5	13830.00
7	30335.60	44.41	1.254	0.30 ( 0.29)	0.96	10836.6	20700.00
8	32237.24	52.73	1.135	0.30 ( 0.29)	0.97	14151.3	10100.00
9	33918.79	60.21	1.042	0.30 ( 0.29)	0.97	17795.1	20300.00
10	35629.02	72.63	0.971	0.30 ( 0.29)	0.96	24054.4	31400.00
11	36780.97	83.53	0.910	0.30 ( 0.29)	0.96	29542.1	13100.00
12	37652.48	90.02	0.873	0.30 ( 0.29)	0.96	32414.8	11801.00
13	39321.14	100.42	0.834	0.30 ( 0.29)	0.96	37732.7	11530.00
14	39936.70	105.87	0.814	0.30 ( 0.29)	0.97	41227.2	13510.00
15	41583.95	118.65	0.766	0.30 ( 0.29)	0.97	49369.2	11350.00
16	41908.43	123.31	0.754	0.30 ( 0.29)	0.97	52542.3	11130.00
17	41428.61	129.43	0.741	0.30 ( 0.29)	0.97	55469.5	12300.00
18	40562.06	138.30	0.722	0.30 ( 0.29)	0.97	59730.0	12400.00
19	39431.33	147.94	0.701	0.30 ( 0.29)	0.97	63131.5	12201.00
20	38399.89	155.54	0.685	0.30 ( 0.29)	0.97	65024.1	12231.00
21	37330.96	163.16	0.668	0.30 ( 0.29)	0.97	66578.1	10400.00
22	35693.76	172.80	0.647	0.30 ( 0.29)	0.97	68023.3	12010.00
23	34614.45	178.33	0.636	0.30 ( 0.29)	0.97	68286.9	10210.00
24	30071.18	209.45	0.604	0.30 ( 0.29)	0.98	69046.6	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 41908.43 Tc (MIN.) = 123.31

AREA-AVERAGED Fm (INCH/HR) = 0.29 AREA-AVERAGED Fp (INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA (ACRES) = 52542.30

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13880.00 TO NODE 13910.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION (MIN.) = 123.31

RAINFALL INTENSITY (INCH/HR) = 0.75

AREA-AVERAGED Fm (INCH/HR) = 0.29

AREA-AVERAGED Fp (INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.97

EFFECTIVE STREAM AREA (ACRES) = 52542.30

TOTAL STREAM AREA (ACRES) = 69046.58

PEAK FLOW RATE (CFS) AT CONFLUENCE = 41908.43

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13889.00 TO NODE 13890.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH (FEET) = 447.89

ELEVATION DATA: UPSTREAM (FEET) = 564.89 DOWNSTREAM (FEET) = 421.92

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

SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 6.976

\* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 4.093

SUBAREA Tc AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
PUBLIC PARK	-	3.03	0.30	0.960	0	6.98

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.960

SUBAREA RUNOFF (CFS) = 10.38

TOTAL AREA (ACRES) = 3.03 PEAK FLOW RATE (CFS) = 10.38

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13890.00 TO NODE 13891.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM (FEET) = 421.92 DOWNSTREAM (FEET) = 392.64

CHANNEL LENGTH THRU SUBAREA (FEET) = 435.33 CHANNEL SLOPE = 0.0673

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.43

\* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 3.621

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	8.12	0.30	0.986	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.986

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 22.58

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.03

AVERAGE FLOW DEPTH (FEET) = 0.41 TRAVEL TIME (MIN.) = 1.44

Tc (MIN.) = 8.42

SUBAREA AREA (ACRES) = 8.12 SUBAREA RUNOFF (CFS) = 24.30

EFFECTIVE AREA (ACRES) = 11.15 AREA-AVERAGED Fm (INCH/HR) = 0.29

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98

TOTAL AREA (ACRES) = 11.1 PEAK FLOW RATE (CFS) = 33.39

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.52

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 0.52 FLOW VELOCITY (FEET/SEC.) = 5.80

LONGEST FLOWPATH FROM NODE 13889.00 TO NODE 13891.00 = 883.22 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13891.00 TO NODE 13892.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM (FEET) = 392.64 DOWNSTREAM (FEET) = 324.46

CHANNEL LENGTH THRU SUBAREA (FEET) = 662.40 CHANNEL SLOPE = 0.1029  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.60  
\* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 3.151  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 12.50 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 49.46  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.69  
AVERAGE FLOW DEPTH (FEET) = 0.58 TRAVEL TIME (MIN.) = 1.44  
Tc (MIN.) = 9.86  
SUBAREA AREA (ACRES) = 12.50 SUBAREA RUNOFF (CFS) = 32.08  
EFFECTIVE AREA (ACRES) = 23.65 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 23.6 PEAK FLOW RATE (CFS) = 60.75  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.65  
  
END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.65 FLOW VELOCITY (FEET/SEC.) = 8.22  
LONGEST FLOWPATH FROM NODE 13889.00 TO NODE 13892.00 = 1545.62 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13892.00 TO NODE 13893.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
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ELEVATION DATA: UPSTREAM (FEET) = 324.46 DOWNSTREAM (FEET) = 240.82  
CHANNEL LENGTH THRU SUBAREA (FEET) = 980.03 CHANNEL SLOPE = 0.0853  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.82  
\* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.847  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 15.87 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 78.96  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.46  
AVERAGE FLOW DEPTH (FEET) = 0.80 TRAVEL TIME (MIN.) = 1.93  
Tc (MIN.) = 11.79  
SUBAREA AREA (ACRES) = 15.87 SUBAREA RUNOFF (CFS) = 36.39  
EFFECTIVE AREA (ACRES) = 39.52 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 39.5 PEAK FLOW RATE (CFS) = 90.67  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.87  
  
END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 0.87 FLOW VELOCITY (FEET/SEC.) = 8.85  
LONGEST FLOWPATH FROM NODE 13889.00 TO NODE 13893.00 = 2525.65 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13893.00 TO NODE 13894.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
-----

ELEVATION DATA: UPSTREAM (FEET) = 240.82 DOWNSTREAM (FEET) = 163.04  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1144.35 CHANNEL SLOPE = 0.0680  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.11  
\* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.542  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 28.41 0.30 0.985 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.985  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 119.44  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.96  
AVERAGE FLOW DEPTH (FEET) = 1.09 TRAVEL TIME (MIN.) = 2.13  
Tc (MIN.) = 13.92  
SUBAREA AREA (ACRES) = 28.41 SUBAREA RUNOFF (CFS) = 57.44  
EFFECTIVE AREA (ACRES) = 67.93 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 67.9 PEAK FLOW RATE (CFS) = 137.24  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.18  
  
END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.18 FLOW VELOCITY (FEET/SEC.) = 9.41  
LONGEST FLOWPATH FROM NODE 13889.00 TO NODE 13894.00 = 3670.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13894.00 TO NODE 13910.00 IS CODE = 31  
-----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<  
-----

ELEVATION DATA: UPSTREAM (FEET) = 163.04 DOWNSTREAM (FEET) = 119.70  
FLOW LENGTH (FEET) = 1899.01 MANNING'S N = 0.013  
DEPTH OF FLOW IN 42.0 INCH PIPE IS 32.7 INCHES  
PIPE-FLOW VELOCITY (FEET/SEC.) = 17.06  
ESTIMATED PIPE DIAMETER (INCH) = 42.00 NUMBER OF PIPES = 1  
PIPE-FLOW (CFS) = 137.24  
PIPE TRAVEL TIME (MIN.) = 1.86 Tc (MIN.) = 15.77  
LONGEST FLOWPATH FROM NODE 13889.00 TO NODE 13910.00 = 5569.01 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13894.00 TO NODE 13910.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
-----  
MAINLINE Tc (MIN.) = 15.77

\* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.324

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	11.69	0.30	0.634	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.634  
 SUBAREA AREA (ACRES) = 11.69 SUBAREA RUNOFF (CFS) = 22.45  
 EFFECTIVE AREA (ACRES) = 79.62 AREA-AVERAGED Fm (INCH/HR) = 0.28  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.94  
 TOTAL AREA (ACRES) = 79.6 PEAK FLOW RATE (CFS) = 146.34

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13894.00 TO NODE 13910.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION (MIN.) = 15.77  
 RAINFALL INTENSITY (INCH/HR) = 2.32  
 AREA-AVERAGED Fm (INCH/HR) = 0.28  
 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.94  
 EFFECTIVE STREAM AREA (ACRES) = 79.62  
 TOTAL STREAM AREA (ACRES) = 79.62  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 146.34

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25929.73	26.78	1.656	0.30 ( 0.29)	0.95	5357.8	13810.00
1	26288.74	28.11	1.601	0.30 ( 0.29)	0.95	5673.6	13850.00
1	27107.85	31.21	1.499	0.30 ( 0.29)	0.96	6395.6	13870.00
1	27146.29	31.36	1.496	0.30 ( 0.29)	0.96	6429.6	10300.00
1	28700.39	37.78	1.366	0.30 ( 0.29)	0.96	8483.8	10400.00
1	29115.84	39.39	1.333	0.30 ( 0.29)	0.96	9073.5	13830.00
1	30335.60	44.41	1.254	0.30 ( 0.29)	0.96	10836.6	20700.00
1	32237.24	52.73	1.135	0.30 ( 0.29)	0.97	14151.3	10100.00
1	33918.79	60.21	1.042	0.30 ( 0.29)	0.97	17795.1	20300.00
1	35629.02	72.63	0.971	0.30 ( 0.29)	0.96	24054.4	31400.00
1	36780.97	83.53	0.910	0.30 ( 0.29)	0.96	29542.1	13100.00
1	37652.48	90.02	0.873	0.30 ( 0.29)	0.96	32414.8	11801.00
1	39321.14	100.42	0.834	0.30 ( 0.29)	0.96	37732.7	11530.00
1	39936.70	105.87	0.814	0.30 ( 0.29)	0.97	41227.2	13510.00
1	41583.95	118.65	0.766	0.30 ( 0.29)	0.97	49369.2	11350.00
1	41908.43	123.31	0.754	0.30 ( 0.29)	0.97	52542.3	11130.00
1	41428.61	129.43	0.741	0.30 ( 0.29)	0.97	55469.5	12300.00
1	40562.06	138.30	0.722	0.30 ( 0.29)	0.97	59730.0	12400.00
1	39431.33	147.94	0.701	0.30 ( 0.29)	0.97	63131.5	12201.00
1	38399.89	155.54	0.685	0.30 ( 0.29)	0.97	65024.1	12231.00
1	37330.96	163.16	0.668	0.30 ( 0.29)	0.97	66578.1	10400.00
1	35693.76	172.80	0.647	0.30 ( 0.29)	0.97	68023.3	12010.00
1	34614.45	178.33	0.636	0.30 ( 0.29)	0.97	68286.9	10210.00
1	30071.18	209.45	0.604	0.30 ( 0.29)	0.98	69046.6	10100.00
2	146.34	15.77	2.324	0.30 ( 0.28)	0.94	79.6	13889.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22850.27	15.77	2.324	0.30 ( 0.29)	0.95	3234.3	13889.00
2	26028.24	26.78	1.656	0.30 ( 0.29)	0.95	5437.4	13810.00
3	26383.32	28.11	1.601	0.30 ( 0.29)	0.95	5753.2	13850.00
4	27195.08	31.21	1.499	0.30 ( 0.29)	0.96	6475.2	13870.00
5	27233.31	31.36	1.496	0.30 ( 0.29)	0.96	6509.2	10300.00
6	28778.10	37.78	1.366	0.30 ( 0.29)	0.96	8563.4	10400.00
7	29191.23	39.39	1.333	0.30 ( 0.29)	0.96	9153.1	13830.00
8	30405.29	44.41	1.254	0.30 ( 0.29)	0.96	10916.2	20700.00
9	32298.38	52.73	1.135	0.30 ( 0.29)	0.97	14230.9	10100.00
10	33973.29	60.21	1.042	0.30 ( 0.29)	0.97	17874.7	20300.00
11	35678.47	72.63	0.971	0.30 ( 0.29)	0.96	24134.0	31400.00
12	36826.00	83.53	0.910	0.30 ( 0.29)	0.96	29621.7	13100.00
13	37694.88	90.02	0.873	0.30 ( 0.29)	0.96	32494.4	11801.00
14	39360.75	100.42	0.834	0.30 ( 0.29)	0.96	37812.3	11530.00
15	39974.85	105.87	0.814	0.30 ( 0.29)	0.97	41306.8	13510.00
16	41618.68	118.65	0.766	0.30 ( 0.29)	0.97	49448.8	11350.00
17	41942.29	123.31	0.754	0.30 ( 0.29)	0.97	52621.9	11130.00
18	41461.53	129.43	0.741	0.30 ( 0.29)	0.97	55549.1	12300.00
19	40593.61	138.30	0.722	0.30 ( 0.29)	0.97	59809.7	12400.00
20	39461.39	147.94	0.701	0.30 ( 0.29)	0.97	63211.1	12201.00
21	38428.79	155.54	0.685	0.30 ( 0.29)	0.97	65103.7	12231.00
22	37358.68	163.16	0.668	0.30 ( 0.29)	0.97	66657.7	10400.00
23	35720.00	172.80	0.647	0.30 ( 0.29)	0.97	68103.0	12010.00
24	34639.83	178.33	0.636	0.30 ( 0.29)	0.97	68366.5	10210.00
25	30094.32	209.45	0.604	0.30 ( 0.29)	0.98	69126.2	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 41942.29 Tc (MIN.) = 123.31  
 EFFECTIVE AREA (ACRES) = 52621.93 AREA-AVERAGED Fm (INCH/HR) = 0.29  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA (ACRES) = 69126.2  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13910.00 = 135259.69 FEET.

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 69126.2 TC (MIN.) = 123.31  
 EFFECTIVE AREA (ACRES) = 52621.93 AREA-AVERAGED Fm (INCH/HR) = 0.29  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.971  
 PEAK FLOW RATE (CFS) = 41942.29

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22850.27	15.77	2.324	0.30 ( 0.29)	0.95	3234.3	13889.00
2	26028.24	26.78	1.656	0.30 ( 0.29)	0.95	5437.4	13810.00
3	26383.32	28.11	1.601	0.30 ( 0.29)	0.95	5753.2	13850.00
4	27195.08	31.21	1.499	0.30 ( 0.29)	0.96	6475.2	13870.00
5	27233.31	31.36	1.496	0.30 ( 0.29)	0.96	6509.2	10300.00
6	28778.10	37.78	1.366	0.30 ( 0.29)	0.96	8563.4	10400.00
7	29191.23	39.39	1.333	0.30 ( 0.29)	0.96	9153.1	13830.00
8	30405.29	44.41	1.254	0.30 ( 0.29)	0.96	10916.2	20700.00
9	32298.38	52.73	1.135	0.30 ( 0.29)	0.97	14230.9	10100.00
10	33973.29	60.21	1.042	0.30 ( 0.29)	0.97	17874.7	20300.00

11	35678.47	72.63	0.971	0.30 ( 0.29)	0.96	24134.0	31400.00
12	36826.00	83.53	0.910	0.30 ( 0.29)	0.96	29621.7	13100.00
13	37694.88	90.02	0.873	0.30 ( 0.29)	0.96	32494.4	11801.00
14	39360.75	100.42	0.834	0.30 ( 0.29)	0.96	37812.3	11530.00
15	39974.85	105.87	0.814	0.30 ( 0.29)	0.97	41306.8	13510.00
16	41618.68	118.65	0.766	0.30 ( 0.29)	0.97	49448.8	11350.00
17	41942.29	123.31	0.754	0.30 ( 0.29)	0.97	52621.9	11130.00
18	41461.53	129.43	0.741	0.30 ( 0.29)	0.97	55549.1	12300.00
19	40593.61	138.30	0.722	0.30 ( 0.29)	0.97	59809.7	12400.00
20	39461.39	147.94	0.701	0.30 ( 0.29)	0.97	63211.1	12201.00
21	38428.79	155.54	0.685	0.30 ( 0.29)	0.97	65103.7	12231.00
22	37358.68	163.16	0.668	0.30 ( 0.29)	0.97	66657.7	10400.00
23	35720.00	172.80	0.647	0.30 ( 0.29)	0.97	68103.0	12010.00
24	34639.83	178.33	0.636	0.30 ( 0.29)	0.97	68366.5	10210.00
25	30094.32	209.45	0.604	0.30 ( 0.29)	0.98	69126.2	10100.00

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=====  
END OF RATIONAL METHOD ANALYSIS



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

-----  
FILE NAME: S39.DAT  
TIME/DATE OF STUDY: 09:38 09/12/2017  
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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

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--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 25.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 4.736
- 2) 10.00; 3.102
- 3) 15.00; 2.384
- 4) 20.00; 1.980
- 5) 25.00; 1.729
- 6) 30.00; 1.522
- 7) 40.00; 1.321
- 8) 50.00; 1.169
- 9) 60.00; 1.042
- 10) 90.00; 0.872
- 11) 120.00; 0.761
- 12) 180.00; 0.631
- 13) 360.00; 0.462
- 14) 1440.00; 0.201

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13900.00 TO NODE 13901.00 IS CODE = 21  
-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 600.65  
ELEVATION DATA: UPSTREAM(FEET) = 442.40 DOWNSTREAM(FEET) = 385.16

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.859  
\* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.979  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
AGRICULTURAL POOR COVER "FALLOW"	-	4.00	0.30	1.000	0	10.86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 9.64  
TOTAL AREA(ACRES) = 4.00 PEAK FLOW RATE(CFS) = 9.64

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13901.00 TO NODE 13902.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 385.16 DOWNSTREAM(FEET) = 288.21  
CHANNEL LENGTH THRU SUBAREA(FEET) = 647.42 CHANNEL SLOPE = 0.1497  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.30  
\* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.725  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	8.47	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.90  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.10  
AVERAGE FLOW DEPTH(FEET) = 0.29 TRAVEL TIME(MIN.) = 1.77  
Tc(MIN.) = 12.63  
SUBAREA AREA(ACRES) = 8.47 SUBAREA RUNOFF(CFS) = 18.48  
EFFECTIVE AREA(ACRES) = 12.47 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 12.5 PEAK FLOW RATE(CFS) = 27.21  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.36

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.36 FLOW VELOCITY(FEET/SEC.) = 6.98  
LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13902.00 = 1248.07 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13902.00 TO NODE 13903.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 288.21 DOWNSTREAM(FEET) = 184.89  
CHANNEL LENGTH THRU SUBAREA(FEET) = 669.27 CHANNEL SLOPE = 0.1544  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.54  
\* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.544  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	23.85	0.30	0.982	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.982  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 51.37  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.88  
AVERAGE FLOW DEPTH(FEET) = 0.52 TRAVEL TIME(MIN.) = 1.26  
Tc(MIN.) = 13.88  
SUBAREA AREA(ACRES) = 23.85 SUBAREA RUNOFF(CFS) = 48.29  
EFFECTIVE AREA(ACRES) = 36.32 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 36.3 PEAK FLOW RATE(CFS) = 73.48  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.65

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.65 FLOW VELOCITY(FEET/SEC.) = 9.98  
LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13903.00 = 1917.34 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13903.00 TO NODE 13904.00 IS CODE = 31  
-----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 184.89 DOWNSTREAM(FEET) = 155.08  
FLOW LENGTH(FEET) = 876.66 MANNING'S N = 0.013  
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000  
DEPTH OF FLOW IN 36.0 INCH PIPE IS 20.7 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 17.45  
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 73.48  
PIPE TRAVEL TIME(MIN.) = 0.84 Tc(MIN.) = 14.72  
LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13904.00 = 2794.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13903.00 TO NODE 13904.00 IS CODE = 81  
-----

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

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MAINLINE Tc(MIN.) = 14.72  
\* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.424  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	23.85	0.30	0.982	-

USER-DEFINED - 21.29 0.30 0.996 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.996  
SUBAREA AREA(ACRES) = 21.29 SUBAREA RUNOFF(CFS) = 40.72  
EFFECTIVE AREA(ACRES) = 57.61 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 57.6 PEAK FLOW RATE(CFS) = 110.27

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13904.00 TO NODE 13920.00 IS CODE = 31  
-----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 155.08 DOWNSTREAM(FEET) = 118.00  
FLOW LENGTH(FEET) = 1961.38 MANNING'S N = 0.013  
DEPTH OF FLOW IN 42.0 INCH PIPE IS 29.5 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 15.28  
ESTIMATED PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 110.27  
PIPE TRAVEL TIME(MIN.) = 2.14 Tc(MIN.) = 16.86  
LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13920.00 = 4755.38 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13904.00 TO NODE 13920.00 IS CODE = 81  
-----

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

=====

MAINLINE Tc(MIN.) = 16.86  
\* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.234  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	43.53	0.30	0.649	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.649  
SUBAREA AREA(ACRES) = 43.53 SUBAREA RUNOFF(CFS) = 79.88  
EFFECTIVE AREA(ACRES) = 101.14 AREA-AVERAGED Fm(INCH/HR) = 0.25  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.84  
TOTAL AREA(ACRES) = 101.1 PEAK FLOW RATE(CFS) = 180.28

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13904.00 TO NODE 13920.00 IS CODE = 10  
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>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13910.00 TO NODE 13910.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 2 <<<<<

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PEAK FLOWRATE TABLE FILE NAME: S38.DNA  
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap (ACRES)	Ae (ACRES)	HEADWATER NODE
1	22850.27	15.77	0.30( 0.29)	0.95	3234.3	13889.00
2	27233.31	31.36	0.30( 0.29)	0.96	6509.2	10300.00

3	29191.23	39.39	0.30	( 0.29)	0.96	9153.1	13830.00
4	30405.29	44.41	0.30	( 0.29)	0.96	10916.2	20700.00
5	32298.38	52.73	0.30	( 0.29)	0.97	14230.9	10100.00
6	33973.29	60.21	0.30	( 0.29)	0.97	17874.7	20300.00
7	35678.47	72.63	0.30	( 0.29)	0.96	24134.0	31400.00
8	36826.00	83.53	0.30	( 0.29)	0.96	29621.7	13100.00
9	37694.88	90.02	0.30	( 0.29)	0.96	32494.4	11801.00
10	39360.75	100.42	0.30	( 0.29)	0.96	37812.3	11530.00
11	39974.85	105.87	0.30	( 0.29)	0.97	41306.8	13510.00
12	41942.29	123.31	0.30	( 0.29)	0.97	52621.9	11130.00
13	41461.53	129.43	0.30	( 0.29)	0.97	55549.1	12300.00
14	40593.61	138.30	0.30	( 0.29)	0.97	59809.7	12400.00
15	39461.39	147.94	0.30	( 0.29)	0.97	63211.1	12201.00
16	38428.79	155.54	0.30	( 0.29)	0.97	65103.7	12231.00
17	37358.68	163.16	0.30	( 0.29)	0.97	66657.7	10400.00
18	35720.00	172.80	0.30	( 0.29)	0.97	68103.0	12010.00
19	34639.83	178.33	0.30	( 0.29)	0.97	68366.5	10210.00
20	30094.32	209.45	0.30	( 0.29)	0.98	69126.2	10100.00

TOTAL AREA (ACRES) = 69126.2

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13910.00 TO NODE 13910.00 IS CODE = 14.0

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22850.27	15.77	0.30 ( 0.29)	0.95	3234.3	13889.00
2	27233.31	31.36	0.30 ( 0.29)	0.96	6509.2	10300.00
3	29191.23	39.39	0.30 ( 0.29)	0.96	9153.1	13830.00
4	30405.29	44.41	0.30 ( 0.29)	0.96	10916.2	20700.00
5	32298.38	52.73	0.30 ( 0.29)	0.97	14230.9	10100.00
6	33973.29	60.21	0.30 ( 0.29)	0.97	17874.7	20300.00
7	35678.47	72.63	0.30 ( 0.29)	0.96	24134.0	31400.00
8	36826.00	83.53	0.30 ( 0.29)	0.96	29621.7	13100.00
9	37694.88	90.02	0.30 ( 0.29)	0.96	32494.4	11801.00
10	39360.75	100.42	0.30 ( 0.29)	0.96	37812.3	11530.00
11	39974.85	105.87	0.30 ( 0.29)	0.97	41306.8	13510.00
12	41942.29	123.31	0.30 ( 0.29)	0.97	52621.9	11130.00
13	41461.53	129.43	0.30 ( 0.29)	0.97	55549.1	12300.00
14	40593.61	138.30	0.30 ( 0.29)	0.97	59809.7	12400.00
15	39461.39	147.94	0.30 ( 0.29)	0.97	63211.1	12201.00
16	38428.79	155.54	0.30 ( 0.29)	0.97	65103.7	12231.00
17	37358.68	163.16	0.30 ( 0.29)	0.97	66657.7	10400.00
18	35720.00	172.80	0.30 ( 0.29)	0.97	68103.0	12010.00
19	34639.83	178.33	0.30 ( 0.29)	0.97	68366.5	10210.00
20	30094.32	209.45	0.30 ( 0.29)	0.98	69126.2	10100.00

TOTAL AREA (ACRES) = 69126.2

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13910.00 TO NODE 13920.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<<

ELEVATION DATA: UPSTREAM( FEET) = 119.70 DOWNSTREAM( FEET) = 118.00

CHANNEL LENGTH THRU SUBAREA( FEET) = 1376.26 CHANNEL SLOPE = 0.0012  
GIVEN CHANNEL BASE( FEET) = 100.00 CHANNEL FREEBOARD( FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT( FEET) = 21.69  
\* 25 YEAR RAINFALL INTENSITY( INCH/HR) = 0.749  
SUBAREA LOSS RATE DATA( AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	96.09	0.30	0.535	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp( INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.535  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW( CFS) = 41967.74  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 10.36  
AVERAGE FLOW DEPTH( FEET) = 21.69 TRAVEL TIME( MIN.) = 2.21  
Tc( MIN.) = 125.52  
SUBAREA AREA( ACRES) = 96.09 SUBAREA RUNOFF( CFS) = 50.90  
EFFECTIVE AREA( ACRES) = 52718.02 AREA-AVERAGED Fm( INCH/HR) = 0.29  
AREA-AVERAGED Fp( INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA( ACRES) = 69222.3 PEAK FLOW RATE( CFS) = 41942.29  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE( FEET) = 100.00 CHANNEL FREEBOARD( FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT( FEET) = 21.68

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH( FEET) = 21.68 FLOW VELOCITY( FEET/SEC.) = 10.36

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13920.00 = 136635.95 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22850.27	18.39	2.110	0.30 ( 0.28)	0.94	3330.4	13889.00
2	27233.31	33.85	1.445	0.30 ( 0.28)	0.95	6605.3	10300.00
3	29191.23	41.83	1.293	0.30 ( 0.29)	0.96	9249.2	13830.00
4	30405.29	46.83	1.217	0.30 ( 0.29)	0.96	11012.3	20700.00
5	32298.38	55.11	1.104	0.30 ( 0.29)	0.96	14327.0	10100.00
6	33973.29	62.55	1.028	0.30 ( 0.29)	0.96	17970.8	20300.00
7	35678.47	74.95	0.957	0.30 ( 0.29)	0.96	24230.1	31400.00
8	36826.00	85.82	0.896	0.30 ( 0.29)	0.96	29717.8	13100.00
9	37694.88	92.29	0.864	0.30 ( 0.29)	0.96	32590.5	11801.00
10	39360.75	102.67	0.825	0.30 ( 0.29)	0.96	37908.4	11530.00
11	39974.85	108.11	0.805	0.30 ( 0.29)	0.96	41402.9	13510.00
12	41942.29	125.52	0.749	0.30 ( 0.29)	0.97	52718.0	11130.00
13	41461.53	131.65	0.736	0.30 ( 0.29)	0.97	55645.2	12300.00
14	40593.61	140.53	0.717	0.30 ( 0.29)	0.97	59905.8	12400.00
15	39461.39	150.19	0.696	0.30 ( 0.29)	0.97	63307.2	12201.00
16	38428.79	157.81	0.679	0.30 ( 0.29)	0.97	65199.8	12231.00
17	37358.68	165.44	0.663	0.30 ( 0.29)	0.97	66753.8	10400.00
18	35720.00	175.11	0.642	0.30 ( 0.29)	0.97	68199.1	12010.00
19	34639.83	180.67	0.630	0.30 ( 0.29)	0.97	68462.6	10210.00
20	30094.32	211.87	0.601	0.30 ( 0.29)	0.97	69222.3	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE( CFS) = 41942.29 Tc( MIN.) = 125.52

AREA-AVERAGED Fm( INCH/HR) = 0.29 AREA-AVERAGED Fp( INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA( ACRES) = 52718.02

\*\*\*\*\*

FLOW PROCESS FROM NODE 13904.00 TO NODE 13920.00 IS CODE = 11

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 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<  
 =====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22850.27	18.39	2.110	0.30 ( 0.28)	0.94	3330.4	13889.00
2	27233.31	33.85	1.445	0.30 ( 0.28)	0.95	6605.3	10300.00
3	29191.23	41.83	1.293	0.30 ( 0.29)	0.96	9249.2	13830.00
4	30405.29	46.83	1.217	0.30 ( 0.29)	0.96	11012.3	20700.00
5	32298.38	55.11	1.104	0.30 ( 0.29)	0.96	14327.0	10100.00
6	33973.29	62.55	1.028	0.30 ( 0.29)	0.96	17970.8	20300.00
7	35678.47	74.95	0.957	0.30 ( 0.29)	0.96	24230.1	31400.00
8	36826.00	85.82	0.896	0.30 ( 0.29)	0.96	29717.8	13100.00
9	37694.88	92.29	0.864	0.30 ( 0.29)	0.96	32590.5	11801.00
10	39360.75	102.67	0.825	0.30 ( 0.29)	0.96	37908.4	11530.00
11	39974.85	108.11	0.805	0.30 ( 0.29)	0.96	41402.9	13510.00
12	41942.29	125.52	0.749	0.30 ( 0.29)	0.97	52718.0	11130.00
13	41461.53	131.65	0.736	0.30 ( 0.29)	0.97	55645.2	12300.00
14	40593.61	140.53	0.717	0.30 ( 0.29)	0.97	59905.8	12400.00
15	39461.39	150.19	0.696	0.30 ( 0.29)	0.97	63307.2	12201.00
16	38428.79	157.81	0.679	0.30 ( 0.29)	0.97	65199.8	12231.00
17	37358.68	165.44	0.663	0.30 ( 0.29)	0.97	66753.8	10400.00
18	35720.00	175.11	0.642	0.30 ( 0.29)	0.97	68199.1	12010.00
19	34639.83	180.67	0.630	0.30 ( 0.29)	0.97	68462.6	10210.00
20	30094.32	211.87	0.601	0.30 ( 0.29)	0.97	69222.3	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13920.00 = 136635.95 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	180.28	16.86	2.234	0.30 ( 0.25)	0.84	101.1	13900.00

LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13920.00 = 4755.38 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22547.06	16.86	2.234	0.30 ( 0.28)	0.94	3155.0	13900.00
2	23019.32	18.39	2.110	0.30 ( 0.28)	0.94	3431.5	13889.00
3	27341.77	33.85	1.445	0.30 ( 0.28)	0.95	6706.5	10300.00
4	29285.90	41.83	1.293	0.30 ( 0.29)	0.96	9350.3	13830.00
5	30493.05	46.83	1.217	0.30 ( 0.29)	0.96	11113.4	20700.00
6	32375.84	55.11	1.104	0.30 ( 0.29)	0.96	14428.2	10100.00
7	34043.79	62.55	1.028	0.30 ( 0.29)	0.96	18072.0	20300.00
8	35742.57	74.95	0.957	0.30 ( 0.29)	0.96	24331.2	31400.00
9	36884.49	85.82	0.896	0.30 ( 0.29)	0.96	29818.9	13100.00
10	37750.44	92.29	0.864	0.30 ( 0.29)	0.96	32691.6	11801.00
11	39412.82	102.67	0.825	0.30 ( 0.29)	0.96	38009.6	11530.00
12	40025.09	108.11	0.805	0.30 ( 0.29)	0.96	41504.0	13510.00
13	41987.44	125.52	0.749	0.30 ( 0.29)	0.97	52819.2	11130.00
14	41505.46	131.65	0.736	0.30 ( 0.29)	0.97	55746.3	12300.00
15	40635.80	140.53	0.717	0.30 ( 0.29)	0.97	60006.9	12400.00
16	39501.67	150.19	0.696	0.30 ( 0.29)	0.97	63408.3	12201.00
17	38467.57	157.81	0.679	0.30 ( 0.29)	0.97	65300.9	12231.00
18	37395.95	165.44	0.663	0.30 ( 0.29)	0.97	66854.9	10400.00
19	35755.36	175.11	0.642	0.30 ( 0.29)	0.97	68300.2	12010.00
20	34674.18	180.67	0.630	0.30 ( 0.29)	0.97	68563.8	10210.00

21 30125.99 211.87 0.601 0.30 ( 0.29) 0.97 69323.4 10100.00  
 TOTAL AREA (ACRES) = 69323.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 41987.44 Tc (MIN.) = 125.521  
 EFFECTIVE AREA (ACRES) = 52819.16 AREA-AVERAGED Fm (INCH/HR) = 0.29  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA (ACRES) = 69323.4  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13920.00 = 136635.95 FEET.

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FLOW PROCESS FROM NODE 13920.00 TO NODE 13921.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM (FEET) = 118.00 DOWNSTREAM (FEET) = 115.28  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 335.44 CHANNEL SLOPE = 0.0081  
 GIVEN CHANNEL BASE (FEET) = 100.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030

\* ESTIMATED CHANNEL HEIGHT (FEET) = 13.41

\* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 0.748

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	134.30	0.30	0.658	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.658

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 42020.74

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 20.40

AVERAGE FLOW DEPTH (FEET) = 13.41 TRAVEL TIME (MIN.) = 0.27

Tc (MIN.) = 125.80

SUBAREA AREA (ACRES) = 134.30 SUBAREA RUNOFF (CFS) = 66.61

EFFECTIVE AREA (ACRES) = 52953.46 AREA-AVERAGED Fm (INCH/HR) = 0.29

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97

TOTAL AREA (ACRES) = 69457.7 PEAK FLOW RATE (CFS) = 41987.44

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE (FEET) = 100.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030

\* ESTIMATED CHANNEL HEIGHT (FEET) = 13.40

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 13.40 FLOW VELOCITY (FEET/SEC.) = 20.40

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13921.00 = 136971.39 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22547.06	17.19	2.207	0.30 ( 0.28)	0.93	3289.3	13900.00
2	23019.32	18.71	2.084	0.30 ( 0.28)	0.93	3565.8	13889.00
3	27341.77	34.16	1.438	0.30 ( 0.28)	0.94	6840.8	10300.00
4	29285.90	42.14	1.289	0.30 ( 0.29)	0.95	9484.6	13830.00
5	30493.05	47.13	1.213	0.30 ( 0.29)	0.96	11247.7	20700.00
6	32375.84	55.41	1.100	0.30 ( 0.29)	0.96	14562.5	10100.00
7	34043.79	62.84	1.026	0.30 ( 0.29)	0.96	18206.3	20300.00
8	35742.57	75.23	0.956	0.30 ( 0.29)	0.96	24465.5	31400.00
9	36884.49	86.11	0.894	0.30 ( 0.29)	0.96	29953.2	13100.00
10	37750.44	92.58	0.862	0.30 ( 0.29)	0.96	32825.9	11801.00

11	39412.82	102.95	0.824	0.30	( 0.29)	0.96	38143.9	11530.00
12	40025.09	108.39	0.804	0.30	( 0.29)	0.96	41638.3	13510.00
13	41987.44	125.80	0.748	0.30	( 0.29)	0.97	52953.5	11130.00
14	41505.46	131.93	0.735	0.30	( 0.29)	0.97	55880.6	12300.00
15	40635.80	140.81	0.716	0.30	( 0.29)	0.97	60141.2	12400.00
16	39501.67	150.47	0.695	0.30	( 0.29)	0.97	63542.6	12201.00
17	38467.57	158.09	0.678	0.30	( 0.29)	0.97	65435.2	12231.00
18	37395.95	165.73	0.662	0.30	( 0.29)	0.97	66989.2	10400.00
19	35755.36	175.40	0.641	0.30	( 0.29)	0.97	68434.5	12010.00
20	34674.18	180.95	0.630	0.30	( 0.29)	0.97	68698.1	10210.00
21	30125.99	212.17	0.601	0.30	( 0.29)	0.97	69457.7	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 41987.44 Tc(MIN.) = 125.80  
 AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 52953.46

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13921.00 TO NODE 14010.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 115.28 DOWNSTREAM(FEET) = 100.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1396.08 CHANNEL SLOPE = 0.0109  
 GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 12.39  
 \* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 0.746  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	96.27	0.30	0.723	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.723  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 42010.37  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 22.70  
 AVERAGE FLOW DEPTH(FEET) = 12.38 TRAVEL TIME(MIN.) = 1.03  
 Tc(MIN.) = 126.82  
 SUBAREA AREA(ACRES) = 96.27 SUBAREA RUNOFF(CFS) = 45.87  
 EFFECTIVE AREA(ACRES) = 53049.73 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 69554.0 PEAK FLOW RATE(CFS) = 41987.44  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 12.38

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 12.38 FLOW VELOCITY(FEET/SEC.) = 22.69  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 14010.00 = 138367.47 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22547.06	18.42	2.107	0.30( 0.28)	0.92	3385.6	13900.00
2	23019.32	19.94	1.985	0.30( 0.28)	0.92	3662.1	13889.00
3	27341.77	35.32	1.415	0.30( 0.28)	0.94	6937.0	10300.00
4	29285.90	43.28	1.271	0.30( 0.28)	0.95	9580.9	13830.00

5	30493.05	48.26	1.196	0.30	( 0.29)	0.95	11344.0	20700.00
6	32375.84	56.51	1.086	0.30	( 0.29)	0.96	14658.7	10100.00
7	34043.79	63.93	1.020	0.30	( 0.29)	0.96	18302.5	20300.00
8	35742.57	76.31	0.950	0.30	( 0.29)	0.96	24561.8	31400.00
9	36884.49	87.17	0.888	0.30	( 0.29)	0.96	30049.5	13100.00
10	37750.44	93.63	0.859	0.30	( 0.29)	0.96	32922.2	11801.00
11	39412.82	103.99	0.820	0.30	( 0.29)	0.96	38240.1	11530.00
12	40025.09	109.43	0.800	0.30	( 0.29)	0.96	41734.6	13510.00
13	41987.44	126.82	0.746	0.30	( 0.29)	0.97	53049.7	11130.00
14	41505.46	132.96	0.733	0.30	( 0.29)	0.97	55976.9	12300.00
15	40635.80	141.84	0.714	0.30	( 0.29)	0.97	60237.5	12400.00
16	39501.67	151.51	0.693	0.30	( 0.29)	0.97	63638.9	12201.00
17	38467.57	159.14	0.676	0.30	( 0.29)	0.97	65531.5	12231.00
18	37395.95	166.79	0.660	0.30	( 0.29)	0.97	67085.5	10400.00
19	35755.36	176.47	0.639	0.30	( 0.29)	0.97	68530.8	12010.00
20	34674.18	182.04	0.629	0.30	( 0.29)	0.97	68794.4	10210.00
21	30125.99	213.30	0.600	0.30	( 0.29)	0.97	69554.0	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 41987.44 Tc(MIN.) = 126.82  
 AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 53049.73

END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 69554.0 TC(MIN.) = 126.82  
 EFFECTIVE AREA(ACRES) = 53049.73 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.969  
 PEAK FLOW RATE(CFS) = 41987.44

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22547.06	18.42	2.107	0.30( 0.28)	0.92	3385.6	13900.00
2	23019.32	19.94	1.985	0.30( 0.28)	0.92	3662.1	13889.00
3	27341.77	35.32	1.415	0.30( 0.28)	0.94	6937.0	10300.00
4	29285.90	43.28	1.271	0.30( 0.28)	0.95	9580.9	13830.00
5	30493.05	48.26	1.196	0.30( 0.29)	0.95	11344.0	20700.00
6	32375.84	56.51	1.086	0.30( 0.29)	0.96	14658.7	10100.00
7	34043.79	63.93	1.020	0.30( 0.29)	0.96	18302.5	20300.00
8	35742.57	76.31	0.950	0.30( 0.29)	0.96	24561.8	31400.00
9	36884.49	87.17	0.888	0.30( 0.29)	0.96	30049.5	13100.00
10	37750.44	93.63	0.859	0.30( 0.29)	0.96	32922.2	11801.00
11	39412.82	103.99	0.820	0.30( 0.29)	0.96	38240.1	11530.00
12	40025.09	109.43	0.800	0.30( 0.29)	0.96	41734.6	13510.00
13	41987.44	126.82	0.746	0.30( 0.29)	0.97	53049.7	11130.00
14	41505.46	132.96	0.733	0.30( 0.29)	0.97	55976.9	12300.00
15	40635.80	141.84	0.714	0.30( 0.29)	0.97	60237.5	12400.00
16	39501.67	151.51	0.693	0.30( 0.29)	0.97	63638.9	12201.00
17	38467.57	159.14	0.676	0.30( 0.29)	0.97	65531.5	12231.00
18	37395.95	166.79	0.660	0.30( 0.29)	0.97	67085.5	10400.00
19	35755.36	176.47	0.639	0.30( 0.29)	0.97	68530.8	12010.00
20	34674.18	182.04	0.629	0.30( 0.29)	0.97	68794.4	10210.00
21	30125.99	213.30	0.600	0.30( 0.29)	0.97	69554.0	10100.00

END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

-----  
FILE NAME: S1.DAT  
TIME/DATE OF STUDY: 10:05 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.622
- 2) 10.00; 4.044
- 3) 15.00; 2.993
- 4) 20.00; 2.461
- 5) 25.00; 2.087
- 6) 30.00; 1.887
- 7) 40.00; 1.580
- 8) 50.00; 1.420
- 9) 60.00; 1.366
- 10) 90.00; 1.157
- 11) 120.00; 1.027
- 12) 180.00; 0.925
- 13) 360.00; 0.719
- 14) 1440.00; 0.327

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10100.00 TO NODE 10101.00 IS CODE = 21  
-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 934.06  
ELEVATION DATA: UPSTREAM(FEET) = 3351.52 DOWNSTREAM(FEET) = 3172.56

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 15.152  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.977  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 3.55 0.30 1.000 0 15.15  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 8.55  
TOTAL AREA (ACRES) = 3.55 PEAK FLOW RATE (CFS) = 8.55

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10101.00 TO NODE 10102.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3172.56 DOWNSTREAM(FEET) = 3090.55  
CHANNEL LENGTH THRU SUBAREA(FEET) = 942.40 CHANNEL SLOPE = 0.0870  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.60  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.612  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN  
USER-DEFINED - 19.22 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 28.65  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.59  
AVERAGE FLOW DEPTH(FEET) = 0.56 TRAVEL TIME(MIN.) = 3.43  
Tc(MIN.) = 18.58  
SUBAREA AREA(ACRES) = 19.22 SUBAREA RUNOFF(CFS) = 40.00  
EFFECTIVE AREA(ACRES) = 22.77 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 22.8 PEAK FLOW RATE(CFS) = 47.39  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.75

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.75 FLOW VELOCITY(FEET/SEC.) = 5.47  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10102.00 = 1876.46 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10102.00 TO NODE 10103.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3090.55 DOWNSTREAM(FEET) = 3022.44  
CHANNEL LENGTH THRU SUBAREA(FEET) = 920.65 CHANNEL SLOPE = 0.0740  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.99

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.371

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	21.52	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 67.46

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.85

AVERAGE FLOW DEPTH(FEET) = 0.97 TRAVEL TIME(MIN.) = 2.62

Tc(MIN.) = 21.20

SUBAREA AREA(ACRES) = 21.52 SUBAREA RUNOFF(CFS) = 40.12

EFFECTIVE AREA(ACRES) = 44.29 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 44.3 PEAK FLOW RATE(CFS) = 82.57

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.09

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.09 FLOW VELOCITY(FEET/SEC.) = 6.23

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10103.00 = 2797.11 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10103.00 TO NODE 10104.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3022.44 DOWNSTREAM(FEET) = 2962.57  
CHANNEL LENGTH THRU SUBAREA(FEET) = 977.87 CHANNEL SLOPE = 0.0612  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.89

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.211

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	126.78	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 191.72

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.61

AVERAGE FLOW DEPTH(FEET) = 1.84 TRAVEL TIME(MIN.) = 2.14

Tc(MIN.) = 23.34

SUBAREA AREA(ACRES) = 126.78 SUBAREA RUNOFF(CFS) = 218.07

EFFECTIVE AREA(ACRES) = 171.07 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 171.1 PEAK FLOW RATE(CFS) = 294.25

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.32 FLOW VELOCITY(FEET/SEC.) = 8.64

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10104.00 = 3774.98 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10104.00 TO NODE 10105.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2962.57 DOWNSTREAM(FEET) = 2917.85  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1864.94 CHANNEL SLOPE = 0.0240  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.46  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.965

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	112.68	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 378.79

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.62

AVERAGE FLOW DEPTH(FEET) = 3.41 TRAVEL TIME(MIN.) = 4.70

Tc(MIN.) = 28.04

SUBAREA AREA(ACRES) = 112.68 SUBAREA RUNOFF(CFS) = 168.90

EFFECTIVE AREA(ACRES) = 283.75 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 283.8 PEAK FLOW RATE(CFS) = 425.33

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.61

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.61 FLOW VELOCITY(FEET/SEC.) = 6.83

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10105.00 = 5639.92 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10105.00 TO NODE 10105.50 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2917.85 DOWNSTREAM(FEET) = 2880.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1406.97 CHANNEL SLOPE = 0.0269  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.05  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.853

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	183.39	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 553.54  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.66  
 AVERAGE FLOW DEPTH(FEET) = 4.01 TRAVEL TIME(MIN.) = 3.06  
 Tc(MIN.) = 31.10  
 SUBAREA AREA(ACRES) = 183.39 SUBAREA RUNOFF(CFS) = 256.37  
 EFFECTIVE AREA(ACRES) = 467.14 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 467.1 PEAK FLOW RATE(CFS) = 653.04  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.36

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.36 FLOW VELOCITY(FEET/SEC.) = 8.00  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10105.50 = 7046.89 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10105.50 TO NODE 10106.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2880.00 DOWNSTREAM(FEET) = 2868.10  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1701.11 CHANNEL SLOPE = 0.0070  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 6.24  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.677

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	60.63	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 690.63  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.95  
 AVERAGE FLOW DEPTH(FEET) = 6.22 TRAVEL TIME(MIN.) = 5.73  
 Tc(MIN.) = 36.83  
 SUBAREA AREA(ACRES) = 60.63 SUBAREA RUNOFF(CFS) = 75.16  
 EFFECTIVE AREA(ACRES) = 527.77 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 527.8 PEAK FLOW RATE(CFS) = 654.23  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 6.06

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 6.06 FLOW VELOCITY(FEET/SEC.) = 4.88  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10106.00 = 8748.00 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10106.00 TO NODE 10107.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2868.10 DOWNSTREAM(FEET) = 2781.28  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2951.00 CHANNEL SLOPE = 0.0294  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.51  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.538

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	123.11	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 722.84  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.50  
 AVERAGE FLOW DEPTH(FEET) = 4.48 TRAVEL TIME(MIN.) = 5.79  
 Tc(MIN.) = 42.62  
 SUBAREA AREA(ACRES) = 123.11 SUBAREA RUNOFF(CFS) = 137.19  
 EFFECTIVE AREA(ACRES) = 650.88 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 650.9 PEAK FLOW RATE(CFS) = 725.32  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.49

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.49 FLOW VELOCITY(FEET/SEC.) = 8.51  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10107.00 = 11699.00 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10107.00 TO NODE 10108.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2781.28 DOWNSTREAM(FEET) = 2725.20  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2630.56 CHANNEL SLOPE = 0.0213  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.19  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.448

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	186.62	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 821.79  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.82  
 AVERAGE FLOW DEPTH(FEET) = 5.17 TRAVEL TIME(MIN.) = 5.61  
 Tc(MIN.) = 48.23  
 SUBAREA AREA(ACRES) = 186.62 SUBAREA RUNOFF(CFS) = 192.89  
 EFFECTIVE AREA(ACRES) = 837.50 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 837.5 PEAK FLOW RATE(CFS) = 865.63  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.31



END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 5.31 FLOW VELOCITY(FEET/SEC.) = 7.92  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10108.00 = 14329.56 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10108.00 TO NODE 10109.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2725.20 DOWNSTREAM(FEET) = 2581.72  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2890.52 CHANNEL SLOPE = 0.0496  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.45  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.406

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	112.07	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 921.41  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.98  
AVERAGE FLOW DEPTH(FEET) = 4.44 TRAVEL TIME(MIN.) = 4.39  
Tc(MIN.) = 52.61

SUBAREA AREA(ACRES) = 112.07 SUBAREA RUNOFF(CFS) = 111.55  
EFFECTIVE AREA(ACRES) = 949.57 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 949.6 PEAK FLOW RATE(CFS) = 945.16  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.50

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 4.50 FLOW VELOCITY(FEET/SEC.) = 11.06  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10109.00 = 17220.08 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10109.00 TO NODE 10110.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2581.72 DOWNSTREAM(FEET) = 2367.59  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2877.15 CHANNEL SLOPE = 0.0744  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.22  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.386

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	145.21	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1016.13  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.08

AVERAGE FLOW DEPTH(FEET) = 4.22 TRAVEL TIME(MIN.) = 3.67  
Tc(MIN.) = 56.28  
SUBAREA AREA(ACRES) = 145.21 SUBAREA RUNOFF(CFS) = 141.95  
EFFECTIVE AREA(ACRES) = 1094.78 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1094.8 PEAK FLOW RATE(CFS) = 1070.18  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.33

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 4.33 FLOW VELOCITY(FEET/SEC.) = 13.25  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10110.00 = 20097.23 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10110.00 TO NODE 10111.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2367.59 DOWNSTREAM(FEET) = 2075.82  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2802.04 CHANNEL SLOPE = 0.1041  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.28  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.370

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	339.01	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1233.41  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.58  
AVERAGE FLOW DEPTH(FEET) = 4.27 TRAVEL TIME(MIN.) = 3.00  
Tc(MIN.) = 59.28

SUBAREA AREA(ACRES) = 339.01 SUBAREA RUNOFF(CFS) = 326.45  
EFFECTIVE AREA(ACRES) = 1433.79 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1433.8 PEAK FLOW RATE(CFS) = 1380.69  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.52

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 4.52 FLOW VELOCITY(FEET/SEC.) = 16.05  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10111.00 = 22899.27 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10111.00 TO NODE 10112.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2075.82 DOWNSTREAM(FEET) = 2004.03  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3782.59 CHANNEL SLOPE = 0.0190  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 7.11  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.321  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 265.32 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1502.59  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.76  
 AVERAGE FLOW DEPTH (FEET) = 7.09 TRAVEL TIME (MIN.) = 7.20  
 Tc (MIN.) = 66.48  
 SUBAREA AREA (ACRES) = 265.32 SUBAREA RUNOFF (CFS) = 243.79  
 EFFECTIVE AREA (ACRES) = 1699.11 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 1699.1 PEAK FLOW RATE (CFS) = 1561.24  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 7.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 7.22 FLOW VELOCITY (FEET/SEC.) = 8.84  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10112.00 = 26681.86 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10112.00 TO NODE 10112.50 IS CODE = 56  
 -----

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>> TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 2004.03 DOWNSTREAM (FEET) = 1982.04  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1479.53 CHANNEL SLOPE = 0.0149  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 7.95  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.300  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 307.63 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1699.69  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.25  
 AVERAGE FLOW DEPTH (FEET) = 7.95 TRAVEL TIME (MIN.) = 2.99  
 Tc (MIN.) = 69.46  
 SUBAREA AREA (ACRES) = 307.63 SUBAREA RUNOFF (CFS) = 276.90  
 EFFECTIVE AREA (ACRES) = 2006.74 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 2006.7 PEAK FLOW RATE (CFS) = 1806.30  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 8.18

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 8.18 FLOW VELOCITY (FEET/SEC.) = 8.38  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10112.50 = 28161.39 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10112.50 TO NODE 10222.00 IS CODE = 56  
 -----

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>> TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 1982.04 DOWNSTREAM (FEET) = 1925.82  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 3416.13 CHANNEL SLOPE = 0.0165  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 8.10  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.255  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 127.40 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1861.05  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.77  
 AVERAGE FLOW DEPTH (FEET) = 8.10 TRAVEL TIME (MIN.) = 6.49  
 Tc (MIN.) = 75.95  
 SUBAREA AREA (ACRES) = 127.40 SUBAREA RUNOFF (CFS) = 109.49  
 EFFECTIVE AREA (ACRES) = 2134.14 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 2134.1 PEAK FLOW RATE (CFS) = 1834.14  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 8.04

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 8.04 FLOW VELOCITY (FEET/SEC.) = 8.74  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10222.00 = 31577.52 FEET.

=====  
 END OF STUDY SUMMARY:  
 TOTAL AREA (ACRES) = 2134.1 TC (MIN.) = 75.95  
 EFFECTIVE AREA (ACRES) = 2134.14 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.000  
 PEAK FLOW RATE (CFS) = 1834.14  
 =====

END OF RATIONAL METHOD ANALYSIS

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

-----  
FILE NAME: S2.DAT  
TIME/DATE OF STUDY: 10:05 04/01/2013  
=====

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-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.643
- 2) 10.00; 4.054
- 3) 15.00; 2.999
- 4) 20.00; 2.465
- 5) 25.00; 2.089
- 6) 30.00; 1.890
- 7) 40.00; 1.583
- 8) 50.00; 1.422
- 9) 60.00; 1.369
- 10) 90.00; 1.160
- 11) 120.00; 1.030
- 12) 180.00; 0.928
- 13) 360.00; 0.723
- 14) 1440.00; 0.328

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	STREETS FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10200.00 TO NODE 10201.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 301.66  
ELEVATION DATA: UPSTREAM(FEET) = 3087.44 DOWNSTREAM(FEET) = 3031.53

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.705  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 4.206  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 1.09 0.30 1.000 0 9.71  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 3.83  
TOTAL AREA (ACRES) = 1.09 PEAK FLOW RATE (CFS) = 3.83

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10201.00 TO NODE 10202.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3031.53 DOWNSTREAM(FEET) = 2903.38  
CHANNEL LENGTH THRU SUBAREA(FEET) = 538.03 CHANNEL SLOPE = 0.2382  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.23  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.675  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN  
USER-DEFINED - 4.06 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.03  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.29  
AVERAGE FLOW DEPTH(FEET) = 0.22 TRAVEL TIME(MIN.) = 2.09  
Tc(MIN.) = 11.80  
SUBAREA AREA(ACRES) = 4.06 SUBAREA RUNOFF(CFS) = 12.33  
EFFECTIVE AREA(ACRES) = 5.15 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 5.2 PEAK FLOW RATE(CFS) = 15.64  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.29

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.29 FLOW VELOCITY(FEET/SEC.) = 5.05  
LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10202.00 = 839.69 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10202.00 TO NODE 10203.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2903.38 DOWNSTREAM(FEET) = 2639.65  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1124.98 CHANNEL SLOPE = 0.2344  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.71

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.201

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	36.13	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 63.08

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.35

AVERAGE FLOW DEPTH(FEET) = 0.67 TRAVEL TIME(MIN.) = 2.25

Tc(MIN.) = 14.04

SUBAREA AREA(ACRES) = 36.13 SUBAREA RUNOFF(CFS) = 94.33

EFFECTIVE AREA(ACRES) = 41.28 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 41.3 PEAK FLOW RATE(CFS) = 107.77

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.91

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.91 FLOW VELOCITY(FEET/SEC.) = 10.01

LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10203.00 = 1964.67 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10203.00 TO NODE 10204.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2639.65 DOWNSTREAM(FEET) = 2444.90  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1897.75 CHANNEL SLOPE = 0.1026  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.55

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.716

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	56.14	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 169.00

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.78

AVERAGE FLOW DEPTH(FEET) = 1.48 TRAVEL TIME(MIN.) = 3.60

Tc(MIN.) = 17.65

SUBAREA AREA(ACRES) = 56.14 SUBAREA RUNOFF(CFS) = 122.08

EFFECTIVE AREA(ACRES) = 97.42 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 97.4 PEAK FLOW RATE(CFS) = 211.85

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.69

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.69 FLOW VELOCITY(FEET/SEC.) = 9.38

LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10204.00 = 3862.42 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10204.00 TO NODE 10205.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2444.90 DOWNSTREAM(FEET) = 2245.64  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1973.02 CHANNEL SLOPE = 0.1010  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.70

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.432

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	264.47	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 466.10

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.77

AVERAGE FLOW DEPTH(FEET) = 2.60 TRAVEL TIME(MIN.) = 2.79

Tc(MIN.) = 20.44

SUBAREA AREA(ACRES) = 264.47 SUBAREA RUNOFF(CFS) = 507.41

EFFECTIVE AREA(ACRES) = 361.89 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 361.9 PEAK FLOW RATE(CFS) = 694.33

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.21

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.21 FLOW VELOCITY(FEET/SEC.) = 13.18

LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10205.00 = 5835.44 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10205.00 TO NODE 10206.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2245.64 DOWNSTREAM(FEET) = 2157.91  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1870.92 CHANNEL SLOPE = 0.0469  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.55

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.213

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	255.55	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 914.53  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.74  
 AVERAGE FLOW DEPTH(FEET) = 4.49 TRAVEL TIME(MIN.) = 2.90  
 Tc(MIN.) = 23.35  
 SUBAREA AREA(ACRES) = 255.55 SUBAREA RUNOFF(CFS) = 440.06  
 EFFECTIVE AREA(ACRES) = 617.44 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 617.4 PEAK FLOW RATE(CFS) = 1063.25  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.83

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.83 FLOW VELOCITY(FEET/SEC.) = 11.18  
 LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10206.00 = 7706.36 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10206.00 TO NODE 10206.50 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2157.91 DOWNSTREAM(FEET) = 2119.30  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1453.59 CHANNEL SLOPE = 0.0266  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.85  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.051

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	141.47	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1174.74  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.30  
 AVERAGE FLOW DEPTH(FEET) = 5.83 TRAVEL TIME(MIN.) = 2.61  
 Tc(MIN.) = 25.95  
 SUBAREA AREA(ACRES) = 141.47 SUBAREA RUNOFF(CFS) = 222.96  
 EFFECTIVE AREA(ACRES) = 758.91 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 758.9 PEAK FLOW RATE(CFS) = 1196.07  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.88

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 5.88 FLOW VELOCITY(FEET/SEC.) = 9.35  
 LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10206.50 = 9159.95 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10206.50 TO NODE 10220.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2119.30 DOWNSTREAM(FEET) = 2093.25  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2020.48 CHANNEL SLOPE = 0.0129  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 7.20  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.872

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	105.39	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1270.64  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.27  
 AVERAGE FLOW DEPTH(FEET) = 7.18 TRAVEL TIME(MIN.) = 4.63  
 Tc(MIN.) = 30.58  
 SUBAREA AREA(ACRES) = 105.39 SUBAREA RUNOFF(CFS) = 149.12  
 EFFECTIVE AREA(ACRES) = 864.30 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 864.3 PEAK FLOW RATE(CFS) = 1222.91  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 7.05

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 7.05 FLOW VELOCITY(FEET/SEC.) = 7.19  
 LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10220.00 = 11180.43 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10206.50 TO NODE 10220.00 IS CODE = 1

-----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 30.58  
 RAINFALL INTENSITY(INCH/HR) = 1.87  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 864.30  
 TOTAL STREAM AREA(ACRES) = 864.30  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 1222.91

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10210.00 TO NODE 10211.00 IS CODE = 21

-----  
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 890.82  
 ELEVATION DATA: UPSTREAM(FEET) = 2966.08 DOWNSTREAM(FEET) = 2867.74

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 16.601  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.828  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc
USER-DEFINED	-	105.39	0.30	1.000	-	

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
 NATURAL FAIR COVER  
 "CHAPARRAL, BROADLEAF" - 7.25 0.30 1.000 0 16.60  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 16.50  
 TOTAL AREA(ACRES) = 7.25 PEAK FLOW RATE(CFS) = 16.50

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10211.00 TO NODE 10212.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2867.74 DOWNSTREAM(FEET) = 2763.75  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1682.06 CHANNEL SLOPE = 0.0618  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.90  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.286

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 33.02 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 46.33  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.85  
 AVERAGE FLOW DEPTH(FEET) = 0.82 TRAVEL TIME(MIN.) = 5.78  
 Tc(MIN.) = 22.39  
 SUBAREA AREA(ACRES) = 33.02 SUBAREA RUNOFF(CFS) = 59.01  
 EFFECTIVE AREA(ACRES) = 40.27 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 40.3 PEAK FLOW RATE(CFS) = 71.97  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.06

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.06 FLOW VELOCITY(FEET/SEC.) = 5.62  
 LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10212.00 = 2572.88 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10212.00 TO NODE 10213.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2763.75 DOWNSTREAM(FEET) = 2662.20  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1206.59 CHANNEL SLOPE = 0.0842  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.39  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.087

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 71.89 0.30 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 129.82  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.54  
 AVERAGE FLOW DEPTH(FEET) = 1.36 TRAVEL TIME(MIN.) = 2.67  
 Tc(MIN.) = 25.05  
 SUBAREA AREA(ACRES) = 71.89 SUBAREA RUNOFF(CFS) = 115.62  
 EFFECTIVE AREA(ACRES) = 112.16 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 112.2 PEAK FLOW RATE(CFS) = 180.38  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.63

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.63 FLOW VELOCITY(FEET/SEC.) = 8.35  
 LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10213.00 = 3779.47 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10213.00 TO NODE 10214.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2662.20 DOWNSTREAM(FEET) = 2520.73  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1783.17 CHANNEL SLOPE = 0.0793  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.30  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.964

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 182.61 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 317.25  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.66  
 AVERAGE FLOW DEPTH(FEET) = 2.26 TRAVEL TIME(MIN.) = 3.08  
 Tc(MIN.) = 28.13  
 SUBAREA AREA(ACRES) = 182.61 SUBAREA RUNOFF(CFS) = 273.56  
 EFFECTIVE AREA(ACRES) = 294.77 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 294.8 PEAK FLOW RATE(CFS) = 441.58  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.70

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.70 FLOW VELOCITY(FEET/SEC.) = 10.63  
 LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10214.00 = 5562.64 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10214.00 TO NODE 10215.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2520.73 DOWNSTREAM(FEET) = 2270.71  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2774.20 CHANNEL SLOPE = 0.0901  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.96  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.828  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 156.94 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 549.50  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.84  
 AVERAGE FLOW DEPTH(FEET) = 2.93 TRAVEL TIME(MIN.) = 3.90  
 Tc(MIN.) = 32.03  
 SUBAREA AREA(ACRES) = 156.94 SUBAREA RUNOFF(CFS) = 215.77  
 EFFECTIVE AREA(ACRES) = 451.71 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 451.7 PEAK FLOW RATE(CFS) = 621.04  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.12  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.12 FLOW VELOCITY(FEET/SEC.) = 12.24  
 LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10215.00 = 8336.84 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10215.00 TO NODE 10216.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 2270.71 DOWNSTREAM(FEET) = 2151.20  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2019.75 CHANNEL SLOPE = 0.0592  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.73  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.733  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 130.62 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 705.27  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.90  
 AVERAGE FLOW DEPTH(FEET) = 3.71 TRAVEL TIME(MIN.) = 3.09  
 Tc(MIN.) = 35.12  
 SUBAREA AREA(ACRES) = 130.62 SUBAREA RUNOFF(CFS) = 168.44  
 EFFECTIVE AREA(ACRES) = 582.33 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 582.3 PEAK FLOW RATE(CFS) = 750.94  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.83

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.83 FLOW VELOCITY(FEET/SEC.) = 11.08  
 LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10216.00 = 10356.59 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10216.00 TO NODE 10216.50 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 2151.20 DOWNSTREAM(FEET) = 2120.63  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1242.42 CHANNEL SLOPE = 0.0246  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.88  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.655  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 51.25 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 782.19  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.13  
 AVERAGE FLOW DEPTH(FEET) = 4.87 TRAVEL TIME(MIN.) = 2.55  
 Tc(MIN.) = 37.67  
 SUBAREA AREA(ACRES) = 51.25 SUBAREA RUNOFF(CFS) = 62.48  
 EFFECTIVE AREA(ACRES) = 633.58 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 633.6 PEAK FLOW RATE(CFS) = 772.45  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.84

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.84 FLOW VELOCITY(FEET/SEC.) = 8.11  
 LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10216.50 = 11599.01 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10216.50 TO NODE 10220.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 2120.63 DOWNSTREAM(FEET) = 2093.25  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1301.06 CHANNEL SLOPE = 0.0210  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.08  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.575  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 26.16 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 787.46  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.69

AVERAGE FLOW DEPTH (FEET) = 5.08 TRAVEL TIME (MIN.) = 2.82  
 Tc (MIN.) = 40.49  
 SUBAREA AREA (ACRES) = 26.16 SUBAREA RUNOFF (CFS) = 30.02  
 EFFECTIVE AREA (ACRES) = 659.74 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 659.7 PEAK FLOW RATE (CFS) = 772.45  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 5.03

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 5.03 FLOW VELOCITY (FEET/SEC.) = 7.65  
 LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10220.00 = 12900.07 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10216.50 TO NODE 10220.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION (MIN.) = 40.49  
 RAINFALL INTENSITY (INCH/HR) = 1.58  
 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA (ACRES) = 659.74  
 TOTAL STREAM AREA (ACRES) = 659.74  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 772.45

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1222.91	30.58	1.872	0.30 (0.30)	1.00	864.3	10200.00
2	772.45	40.49	1.575	0.30 (0.30)	1.00	659.7	10210.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1942.29	30.58	1.872	0.30 (0.30)	1.00	1362.7	10200.00
2	1764.41	40.49	1.575	0.30 (0.30)	1.00	1524.0	10210.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE (CFS) = 1942.29 Tc (MIN.) = 30.58  
 EFFECTIVE AREA (ACRES) = 1362.67 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 1524.0  
 LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10220.00 = 12900.07 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10220.00 TO NODE 10221.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2093.25 DOWNSTREAM (FEET) = 1965.76  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2966.11 CHANNEL SLOPE = 0.0430  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.72  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.753

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	104.45	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2010.60  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.79  
 AVERAGE FLOW DEPTH (FEET) = 6.71 TRAVEL TIME (MIN.) = 3.86  
 Tc (MIN.) = 34.45

SUBAREA AREA (ACRES) = 104.45 SUBAREA RUNOFF (CFS) = 136.63  
 EFFECTIVE AREA (ACRES) = 1467.12 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 1628.5 PEAK FLOW RATE (CFS) = 1942.29  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.60

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 6.60 FLOW VELOCITY (FEET/SEC.) = 12.67  
 LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10221.00 = 15866.18 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10221.00 TO NODE 10221.50 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1965.76 DOWNSTREAM (FEET) = 1950.00  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1346.48 CHANNEL SLOPE = 0.0117  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 9.15  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.666

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	169.50	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2046.52  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.92  
 AVERAGE FLOW DEPTH (FEET) = 9.14 TRAVEL TIME (MIN.) = 2.83  
 Tc (MIN.) = 37.28

SUBAREA AREA (ACRES) = 169.50 SUBAREA RUNOFF (CFS) = 208.46  
 EFFECTIVE AREA (ACRES) = 1636.62 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 1798.0 PEAK FLOW RATE (CFS) = 2012.82  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0



"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 9.07

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 9.07 FLOW VELOCITY (FEET/SEC.) = 7.89  
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10221.50 = 17212.66 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10221.50 TO NODE 10222.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1950.00 DOWNSTREAM (FEET) = 1925.82  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1849.80 CHANNEL SLOPE = 0.0131  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 8.90  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.567  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	43.12	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2037.40  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.25  
AVERAGE FLOW DEPTH (FEET) = 8.89 TRAVEL TIME (MIN.) = 3.74  
Tc (MIN.) = 41.02  
SUBAREA AREA (ACRES) = 43.12 SUBAREA RUNOFF (CFS) = 49.16  
EFFECTIVE AREA (ACRES) = 1679.74 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 1841.1 PEAK FLOW RATE (CFS) = 2012.82  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 8.85

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 8.85 FLOW VELOCITY (FEET/SEC.) = 8.22  
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10222.00 = 19062.46 FEET.

=====

END OF STUDY SUMMARY:  
TOTAL AREA (ACRES) = 1841.1 TC (MIN.) = 41.02  
EFFECTIVE AREA (ACRES) = 1679.74 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.000  
PEAK FLOW RATE (CFS) = 2012.82

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2012.82	41.02	1.567	0.30 (0.30)	1.00	1679.7	10200.00
2	1884.60	51.16	1.416	0.30 (0.30)	1.00	1841.1	10210.00

=====

END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*

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

Analysis prepared by:

FILE NAME: S3.DAT
TIME/DATE OF STUDY: 10:05 04/01/2013

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.660
2) 10.00; 4.061
3) 15.00; 3.003
4) 20.00; 2.468
5) 25.00; 2.092
6) 30.00; 1.892
7) 40.00; 1.584
8) 50.00; 1.424
9) 60.00; 1.372
10) 90.00; 1.162
11) 120.00; 1.032
12) 180.00; 0.931
13) 360.00; 0.725
14) 1440.00; 0.329

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*
Table with columns: NO., WIDTH (FT), CROSSFALL (FT), IN- / SIDE, OUT- / SIDE, / WAY, CURB HEIGHT (FT), GUTTER WIDTH (FT), LIP (FT), GEOMETRIES HIKE (FT), MANNING FACTOR (n)

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 10300.00 TO NODE 10301.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 310.52
ELEVATION DATA: UPSTREAM(FEET) = 4227.21 DOWNSTREAM(FEET) = 4064.64

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.977
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 5.112
SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)
NATURAL FAIR COVER
"CHAPARRAL,NARROWLEAF" - 1.00 0.30 1.000 0 7.98
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 4.33
TOTAL AREA (ACRES) = 1.00 PEAK FLOW RATE (CFS) = 4.33

\*\*\*\*\*

FLOW PROCESS FROM NODE 10301.00 TO NODE 10302.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 4064.64 DOWNSTREAM(FEET) = 3797.25
CHANNEL LENGTH THRU SUBAREA(FEET) = 631.34 CHANNEL SLOPE = 0.4235
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.26
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 4.216
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN
USER-DEFINED - 6.23 0.30 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 15.43
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.10
AVERAGE FLOW DEPTH(FEET) = 0.24 TRAVEL TIME(MIN.) = 1.72
Tc(MIN.) = 9.70
SUBAREA AREA(ACRES) = 6.23 SUBAREA RUNOFF(CFS) = 21.96
EFFECTIVE AREA(ACRES) = 7.23 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 7.2 PEAK FLOW RATE(CFS) = 25.48
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.33

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.33 FLOW VELOCITY(FEET/SEC.) = 7.36
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10302.00 = 941.86 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10302.00 TO NODE 10303.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3797.25 DOWNSTREAM(FEET) = 3447.07  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1908.89 CHANNEL SLOPE = 0.1834  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.84

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.285

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	32.83	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 70.23

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.02

AVERAGE FLOW DEPTH(FEET) = 0.76 TRAVEL TIME(MIN.) = 3.97

Tc(MIN.) = 13.67

SUBAREA AREA(ACRES) = 32.83 SUBAREA RUNOFF(CFS) = 88.19

EFFECTIVE AREA(ACRES) = 40.06 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 40.1 PEAK FLOW RATE(CFS) = 107.62

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.97

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.97 FLOW VELOCITY(FEET/SEC.) = 9.25

LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10303.00 = 2850.75 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10303.00 TO NODE 10304.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3447.07 DOWNSTREAM(FEET) = 3228.48  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1918.05 CHANNEL SLOPE = 0.1140  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.54

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.772

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	60.51	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 175.18

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.17

AVERAGE FLOW DEPTH(FEET) = 1.48 TRAVEL TIME(MIN.) = 3.49

Tc(MIN.) = 17.15

SUBAREA AREA(ACRES) = 60.51 SUBAREA RUNOFF(CFS) = 134.65

EFFECTIVE AREA(ACRES) = 100.57 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 100.6 PEAK FLOW RATE(CFS) = 223.79

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.69

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.69 FLOW VELOCITY(FEET/SEC.) = 9.89

LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10304.00 = 4768.80 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10304.00 TO NODE 10305.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3228.48 DOWNSTREAM(FEET) = 3118.37  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1679.40 CHANNEL SLOPE = 0.0656  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.52

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.453

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	116.56	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 336.89

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.18

AVERAGE FLOW DEPTH(FEET) = 2.46 TRAVEL TIME(MIN.) = 3.05

Tc(MIN.) = 20.20

SUBAREA AREA(ACRES) = 116.56 SUBAREA RUNOFF(CFS) = 225.83

EFFECTIVE AREA(ACRES) = 217.13 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 217.1 PEAK FLOW RATE(CFS) = 420.69

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.76

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.76 FLOW VELOCITY(FEET/SEC.) = 9.80

LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10305.00 = 6448.20 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10305.00 TO NODE 10306.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3118.37 DOWNSTREAM(FEET) = 2807.99  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2853.67 CHANNEL SLOPE = 0.1088  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.93

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.175

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	189.23	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 580.60  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.88  
AVERAGE FLOW DEPTH(FEET) = 2.87 TRAVEL TIME(MIN.) = 3.69  
Tc(MIN.) = 23.90  
SUBAREA AREA(ACRES) = 189.23 SUBAREA RUNOFF(CFS) = 319.33  
EFFECTIVE AREA(ACRES) = 406.36 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 406.4 PEAK FLOW RATE(CFS) = 685.75  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.13

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.13 FLOW VELOCITY(FEET/SEC.) = 13.47  
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10306.00 = 9301.87 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10306.00 TO NODE 10307.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2807.99 DOWNSTREAM(FEET) = 2591.87  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2848.03 CHANNEL SLOPE = 0.0759  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.24  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.991

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 416.51 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1003.03  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.12  
AVERAGE FLOW DEPTH(FEET) = 4.17 TRAVEL TIME(MIN.) = 3.62  
Tc(MIN.) = 27.51  
SUBAREA AREA(ACRES) = 416.51 SUBAREA RUNOFF(CFS) = 634.08  
EFFECTIVE AREA(ACRES) = 822.87 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 822.9 PEAK FLOW RATE(CFS) = 1252.70  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.66

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 4.66 FLOW VELOCITY(FEET/SEC.) = 13.93  
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10307.00 = 12149.90 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10307.00 TO NODE 10308.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2591.87 DOWNSTREAM(FEET) = 2516.62  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2862.06 CHANNEL SLOPE = 0.0263  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.56  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.819

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 320.49 0.30 0.986 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.986  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1472.50  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.84  
AVERAGE FLOW DEPTH(FEET) = 6.51 TRAVEL TIME(MIN.) = 4.85  
Tc(MIN.) = 32.36  
SUBAREA AREA(ACRES) = 320.49 SUBAREA RUNOFF(CFS) = 439.44  
EFFECTIVE AREA(ACRES) = 1143.36 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1143.4 PEAK FLOW RATE(CFS) = 1564.60  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.70

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 6.70 FLOW VELOCITY(FEET/SEC.) = 9.99  
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10308.00 = 15011.96 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10308.00 TO NODE 10308.50 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2516.62 DOWNSTREAM(FEET) = 2462.25  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1889.32 CHANNEL SLOPE = 0.0288  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.81  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.727

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 191.88 0.30 0.966 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.966  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1688.72  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.54  
AVERAGE FLOW DEPTH(FEET) = 6.79 TRAVEL TIME(MIN.) = 2.99  
Tc(MIN.) = 35.35  
SUBAREA AREA(ACRES) = 191.88 SUBAREA RUNOFF(CFS) = 248.23  
EFFECTIVE AREA(ACRES) = 1335.24 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 1335.2 PEAK FLOW RATE(CFS) = 1718.11  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.85

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 6.85 FLOW VELOCITY(FEET/SEC.) = 10.57  
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10308.50 = 16901.28 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10308.50 TO NODE 10309.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2462.25 DOWNSTREAM(FEET) = 2409.87  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1874.33 CHANNEL SLOPE = 0.0279  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.01  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.636

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 90.14 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1772.30  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.55  
AVERAGE FLOW DEPTH(FEET) = 7.00 TRAVEL TIME(MIN.) = 2.96  
Tc(MIN.) = 38.31  
SUBAREA AREA(ACRES) = 90.14 SUBAREA RUNOFF(CFS) = 108.39  
EFFECTIVE AREA(ACRES) = 1425.38 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 1425.4 PEAK FLOW RATE(CFS) = 1718.11  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.90

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 6.90 FLOW VELOCITY(FEET/SEC.) = 10.46  
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10309.00 = 18775.61 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10309.00 TO NODE 10330.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2409.87 DOWNSTREAM(FEET) = 2330.13  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2576.20 CHANNEL SLOPE = 0.0310  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.83  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.548

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 83.83 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1765.20

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.94  
AVERAGE FLOW DEPTH(FEET) = 6.82 TRAVEL TIME(MIN.) = 3.92  
Tc(MIN.) = 42.24  
SUBAREA AREA(ACRES) = 83.83 SUBAREA RUNOFF(CFS) = 94.18  
EFFECTIVE AREA(ACRES) = 1509.21 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 1509.2 PEAK FLOW RATE(CFS) = 1718.11  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.73

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 6.73 FLOW VELOCITY(FEET/SEC.) = 10.87  
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10330.00 = 21351.81 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10309.00 TO NODE 10330.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 42.24  
RAINFALL INTENSITY(INCH/HR) = 1.55  
AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.99  
EFFECTIVE STREAM AREA(ACRES) = 1509.21  
TOTAL STREAM AREA(ACRES) = 1509.21  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 1718.11

\*\*\*\*\*

FLOW PROCESS FROM NODE 10320.00 TO NODE 10321.00 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
INITIAL SUBAREA FLOW-LENGTH(FEET) = 290.56  
ELEVATION DATA: UPSTREAM(FEET) = 3374.80 DOWNSTREAM(FEET) = 3300.24

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.959  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 4.602  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 2.24 0.30 1.000 0 8.96  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 8.67  
TOTAL AREA(ACRES) = 2.24 PEAK FLOW RATE(CFS) = 8.67

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FLOW PROCESS FROM NODE 10321.00 TO NODE 10322.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3300.24 DOWNSTREAM(FEET) = 3187.21  
CHANNEL LENGTH THRU SUBAREA(FEET) = 581.07 CHANNEL SLOPE = 0.1945  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.34

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.860

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	5.01	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.74

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.86

AVERAGE FLOW DEPTH(FEET) = 0.32 TRAVEL TIME(MIN.) = 1.99

Tc(MIN.) = 10.95

SUBAREA AREA(ACRES) = 5.01 SUBAREA RUNOFF(CFS) = 16.05

EFFECTIVE AREA(ACRES) = 7.25 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 7.2 PEAK FLOW RATE(CFS) = 23.23

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.39

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.39 FLOW VELOCITY(FEET/SEC.) = 5.50

LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10322.00 = 871.63 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10322.00 TO NODE 10323.00 IS CODE = 56

-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3187.21 DOWNSTREAM(FEET) = 3108.86  
CHANNEL LENGTH THRU SUBAREA(FEET) = 977.98 CHANNEL SLOPE = 0.0801

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.98

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.274

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	30.37	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 64.18

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.89

AVERAGE FLOW DEPTH(FEET) = 0.92 TRAVEL TIME(MIN.) = 2.77

Tc(MIN.) = 13.72

SUBAREA AREA(ACRES) = 30.37 SUBAREA RUNOFF(CFS) = 81.30

EFFECTIVE AREA(ACRES) = 37.62 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 37.6 PEAK FLOW RATE(CFS) = 100.71

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.19

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.19 FLOW VELOCITY(FEET/SEC.) = 6.81

LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10323.00 = 1849.61 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10323.00 TO NODE 10324.00 IS CODE = 56

-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3108.86 DOWNSTREAM(FEET) = 2923.03  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1924.11 CHANNEL SLOPE = 0.0966

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.63

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.746

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	68.88	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 176.83

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.70

AVERAGE FLOW DEPTH(FEET) = 1.55 TRAVEL TIME(MIN.) = 3.69

Tc(MIN.) = 17.41

SUBAREA AREA(ACRES) = 68.88 SUBAREA RUNOFF(CFS) = 151.62

EFFECTIVE AREA(ACRES) = 106.50 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 106.5 PEAK FLOW RATE(CFS) = 234.42

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.81

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.81 FLOW VELOCITY(FEET/SEC.) = 9.49

LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10324.00 = 3773.72 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10324.00 TO NODE 10325.00 IS CODE = 56

-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2923.03 DOWNSTREAM(FEET) = 2675.11  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2788.58 CHANNEL SLOPE = 0.0889

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.47

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.331

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	146.19	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 368.46  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.51  
AVERAGE FLOW DEPTH(FEET) = 2.38 TRAVEL TIME(MIN.) = 4.42  
Tc(MIN.) = 21.83  
SUBAREA AREA(ACRES) = 146.19 SUBAREA RUNOFF(CFS) = 267.19  
EFFECTIVE AREA(ACRES) = 252.69 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 252.7 PEAK FLOW RATE(CFS) = 461.85  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.68

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.68 FLOW VELOCITY(FEET/SEC.) = 11.22  
LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10325.00 = 6562.30 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10325.00 TO NODE 10326.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2675.11 DOWNSTREAM(FEET) = 2541.92  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2862.28 CHANNEL SLOPE = 0.0465  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.09  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.028

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	321.78	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 712.58  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.00  
AVERAGE FLOW DEPTH(FEET) = 3.97 TRAVEL TIME(MIN.) = 4.77  
Tc(MIN.) = 26.59

SUBAREA AREA(ACRES) = 321.78 SUBAREA RUNOFF(CFS) = 500.53  
EFFECTIVE AREA(ACRES) = 574.47 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 574.5 PEAK FLOW RATE(CFS) = 893.58  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.45

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 4.45 FLOW VELOCITY(FEET/SEC.) = 10.64  
LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10326.00 = 9424.58 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10326.00 TO NODE 10326.50 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2541.92 DOWNSTREAM(FEET) = 2438.80  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2617.40 CHANNEL SLOPE = 0.0394

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.99  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.868

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	187.06	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1025.57  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.39  
AVERAGE FLOW DEPTH(FEET) = 4.96 TRAVEL TIME(MIN.) = 4.20  
Tc(MIN.) = 30.79

SUBAREA AREA(ACRES) = 187.06 SUBAREA RUNOFF(CFS) = 263.93  
EFFECTIVE AREA(ACRES) = 761.53 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 761.5 PEAK FLOW RATE(CFS) = 1074.46  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.07

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 5.07 FLOW VELOCITY(FEET/SEC.) = 10.52  
LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10326.50 = 12041.98 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10326.50 TO NODE 10327.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2438.80 DOWNSTREAM(FEET) = 2414.64  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1181.79 CHANNEL SLOPE = 0.0204  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.10  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.795

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	82.27	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1129.81  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.36  
AVERAGE FLOW DEPTH(FEET) = 6.09 TRAVEL TIME(MIN.) = 2.36  
Tc(MIN.) = 33.15

SUBAREA AREA(ACRES) = 82.27 SUBAREA RUNOFF(CFS) = 110.70  
EFFECTIVE AREA(ACRES) = 843.80 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 843.8 PEAK FLOW RATE(CFS) = 1135.44  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.11

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 6.11 FLOW VELOCITY(FEET/SEC.) = 8.37

LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10327.00 = 13223.77 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10327.00 TO NODE 10327.50 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2414.64 DOWNSTREAM(FEET) = 2389.73
CHANNEL LENGTH THRU SUBAREA(FEET) = 2431.92 CHANNEL SLOPE = 0.0102
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.66

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.608

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 243.69 0.30 0.997 -

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.997

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1279.08

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.68

AVERAGE FLOW DEPTH(FEET) = 7.60 TRAVEL TIME(MIN.) = 6.06

Tc(MIN.) = 39.21

SUBAREA AREA(ACRES) = 243.69 SUBAREA RUNOFF(CFS) = 287.15

EFFECTIVE AREA(ACRES) = 1087.49 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1087.5 PEAK FLOW RATE(CFS) = 1280.76

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.60

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 7.60 FLOW VELOCITY(FEET/SEC.) = 6.68

LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10327.50 = 15655.69 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10327.50 TO NODE 10330.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2389.73 DOWNSTREAM(FEET) = 2330.13
CHANNEL LENGTH THRU SUBAREA(FEET) = 1944.59 CHANNEL SLOPE = 0.0306
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.96

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.545

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 69.36 0.30 1.000 -

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1319.63

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.11

AVERAGE FLOW DEPTH(FEET) = 5.96 TRAVEL TIME(MIN.) = 3.20

Tc(MIN.) = 42.42

SUBAREA AREA(ACRES) = 69.36 SUBAREA RUNOFF(CFS) = 77.74
EFFECTIVE AREA(ACRES) = 1156.85 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 1156.8 PEAK FLOW RATE(CFS) = 1296.88
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.91

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 5.91 FLOW VELOCITY(FEET/SEC.) = 10.06

LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10330.00 = 17600.28 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10327.50 TO NODE 10330.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 42.42

RAINFALL INTENSITY(INCH/HR) = 1.55

AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA(ACRES) = 1156.85

TOTAL STREAM AREA(ACRES) = 1156.85

PEAK FLOW RATE(CFS) AT CONFLUENCE = 1296.88

\*\* CONFLUENCE DATA \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 1718.11 42.24 1.548 0.30( 0.30) 0.99 1509.2 10300.00
2 1296.88 42.42 1.545 0.30( 0.30) 1.00 1156.8 10320.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 3012.48 42.24 1.548 0.30( 0.30) 1.00 2661.2 10300.00
2 3011.05 42.42 1.545 0.30( 0.30) 1.00 2666.1 10320.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 3012.48 Tc(MIN.) = 42.24

EFFECTIVE AREA(ACRES) = 2661.18 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 2666.1

LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10330.00 = 21351.81 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10330.00 TO NODE 10331.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2330.13 DOWNSTREAM(FEET) = 2041.66



CHANNEL LENGTH THRU SUBAREA (FEET) = 3034.53 CHANNEL SLOPE = 0.0951  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.78  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.506  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 70.23 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 3050.60  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 19.11  
 AVERAGE FLOW DEPTH (FEET) = 6.78 TRAVEL TIME (MIN.) = 2.65  
 Tc (MIN.) = 44.88  
 SUBAREA AREA (ACRES) = 70.23 SUBAREA RUNOFF (CFS) = 76.22  
 EFFECTIVE AREA (ACRES) = 2731.41 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 2736.3 PEAK FLOW RATE (CFS) = 3012.48  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.73

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 6.73 FLOW VELOCITY (FEET/SEC.) = 19.06  
 LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10331.00 = 24386.34 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10331.00 TO NODE 10332.00 IS CODE = 56  
 -----  
 >>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<<  
 >>>> TRAVEL TIME THRU SUBAREA <<<<<<  
 -----  
 ELEVATION DATA: UPSTREAM (FEET) = 2041.66 DOWNSTREAM (FEET) = 1739.96  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 3264.87 CHANNEL SLOPE = 0.0924  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.84  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.460  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 104.94 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 3067.26  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 18.94  
 AVERAGE FLOW DEPTH (FEET) = 6.84 TRAVEL TIME (MIN.) = 2.87  
 Tc (MIN.) = 47.76  
 SUBAREA AREA (ACRES) = 104.94 SUBAREA RUNOFF (CFS) = 109.55  
 EFFECTIVE AREA (ACRES) = 2836.35 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 2841.2 PEAK FLOW RATE (CFS) = 3012.48  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.78

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 6.78 FLOW VELOCITY (FEET/SEC.) = 18.86  
 LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10332.00 = 27651.21 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10331.00 TO NODE 10332.00 IS CODE = 10  
 -----  
 >>>> MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<<  
 -----  
 \*\*\*\*\*  
 FLOW PROCESS FROM NODE 10112.50 TO NODE 10222.00 IS CODE = 15.1  
 -----  
 >>>> DEFINE MEMORY BANK # 2 <<<<<<  
 -----  
 PEAK FLOWRATE TABLE FILE NAME: S1.DNA  
 MEMORY BANK # 2 DEFINED AS FOLLOWS:  
 STREAM Q Tc Fp (Fm) Ap Ae HEADWATER  
 NUMBER (CFS) (MIN.) (INCH/HR) (ACRES) NODE  
 1 1834.14 75.95 0.30 ( 0.30) 1.00 2134.1 10100.00  
 TOTAL AREA (ACRES) = 2134.1  
 -----  
 \*\*\*\*\*  
 FLOW PROCESS FROM NODE 10221.50 TO NODE 10222.00 IS CODE = 15.1  
 -----  
 >>>> DEFINE MEMORY BANK # 3 <<<<<<  
 -----  
 PEAK FLOWRATE TABLE FILE NAME: S2.DNA  
 MEMORY BANK # 3 DEFINED AS FOLLOWS:  
 STREAM Q Tc Fp (Fm) Ap Ae HEADWATER  
 NUMBER (CFS) (MIN.) (INCH/HR) (ACRES) NODE  
 1 2012.82 41.02 0.30 ( 0.30) 1.00 1679.7 10200.00  
 2 1884.60 51.16 0.30 ( 0.30) 1.00 1841.1 10210.00  
 TOTAL AREA (ACRES) = 1841.1  
 -----  
 \*\*\*\*\*  
 FLOW PROCESS FROM NODE 10221.50 TO NODE 10222.00 IS CODE = 14.0  
 -----  
 >>>> MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY <<<<<<  
 -----  
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
 STREAM Q Tc Fp (Fm) Ap Ae HEADWATER  
 NUMBER (CFS) (MIN.) (INCH/HR) (ACRES) NODE  
 1 2012.82 41.02 0.30 ( 0.30) 1.00 1679.7 10200.00  
 2 1884.60 51.16 0.30 ( 0.30) 1.00 1841.1 10210.00  
 TOTAL AREA (ACRES) = 1841.1  
 -----  
 \*\*\*\*\*  
 FLOW PROCESS FROM NODE 10112.50 TO NODE 10222.00 IS CODE = 11  
 -----  
 >>>> CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY <<<<<<  
 -----  
 \*\* MAIN STREAM CONFLUENCE DATA \*\*  
 STREAM Q Tc Intensity Fp (Fm) Ap Ae HEADWATER  
 NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE

1 2012.82 41.02 1.568 0.30( 0.30) 1.00 1679.7 10200.00  
2 1884.60 51.16 1.418 0.30( 0.30) 1.00 1841.1 10210.00  
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10222.00 = 19062.46 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1834.14	75.95	1.260	0.30( 0.30)	1.00	2134.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10222.00 = 31577.52 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3320.40	41.02	1.568	0.30( 0.30)	1.00	2832.3	10200.00
2	3322.85	51.16	1.418	0.30( 0.30)	1.00	3278.6	10210.00
3	3453.02	75.95	1.260	0.30( 0.30)	1.00	3975.2	10100.00

TOTAL AREA (ACRES) = 3975.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 3453.02 Tc(MIN.) = 75.954  
EFFECTIVE AREA(ACRES) = 3975.25 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 3975.2  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10222.00 = 31577.52 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10222.00 TO NODE 10332.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1925.82 DOWNSTREAM(FEET) = 1739.96  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1475.92 CHANNEL SLOPE = 0.1259  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.73  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.252  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	19.92	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3461.56  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 21.91  
AVERAGE FLOW DEPTH(FEET) = 6.73 TRAVEL TIME(MIN.) = 1.12  
Tc(MIN.) = 77.08  
SUBAREA AREA(ACRES) = 19.92 SUBAREA RUNOFF(CFS) = 17.08  
EFFECTIVE AREA(ACRES) = 3995.17 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 3995.2 PEAK FLOW RATE(CFS) = 3453.02  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.72

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 6.72 FLOW VELOCITY(FEET/SEC.) = 21.90

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10332.00 = 33053.44 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10331.00 TO NODE 10332.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3320.40	42.15	1.550	0.30( 0.30)	1.00	2852.3	10200.00
2	3322.85	52.30	1.412	0.30( 0.30)	1.00	3298.6	10210.00
3	3453.02	77.08	1.252	0.30( 0.30)	1.00	3995.2	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10332.00 = 33053.44 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3012.48	47.76	1.460	0.30( 0.30)	1.00	2836.4	10300.00
2	3011.05	47.93	1.457	0.30( 0.30)	1.00	2841.2	10320.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6184.75	42.15	1.550	0.30( 0.30)	1.00	5355.9	10200.00
2	6334.23	47.76	1.460	0.30( 0.30)	1.00	5935.2	10300.00
3	6332.85	47.93	1.457	0.30( 0.30)	1.00	5947.9	10320.00
4	6216.98	52.30	1.412	0.30( 0.30)	1.00	6139.8	10210.00
5	5932.27	77.08	1.252	0.30( 0.30)	1.00	6836.4	10100.00

TOTAL AREA(ACRES) = 6836.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 6334.23 Tc(MIN.) = 47.757  
EFFECTIVE AREA(ACRES) = 5935.17 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 6836.4  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10332.00 = 33053.44 FEET.

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 6836.4 TC(MIN.) = 47.76  
EFFECTIVE AREA(ACRES) = 5935.17 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.998  
PEAK FLOW RATE(CFS) = 6334.23

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6184.75	42.15	1.550	0.30( 0.30)	1.00	5355.9	10200.00
2	6334.23	47.76	1.460	0.30( 0.30)	1.00	5935.2	10300.00
3	6332.85	47.93	1.457	0.30( 0.30)	1.00	5947.9	10320.00
4	6216.98	52.30	1.412	0.30( 0.30)	1.00	6139.8	10210.00
5	5932.27	77.08	1.252	0.30( 0.30)	1.00	6836.4	10100.00

END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

-----  
FILE NAME: S4.DAT  
TIME/DATE OF STUDY: 10:05 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.582
- 2) 10.00; 4.025
- 3) 15.00; 2.982
- 4) 20.00; 2.453
- 5) 25.00; 2.081
- 6) 30.00; 1.882
- 7) 40.00; 1.577
- 8) 50.00; 1.416
- 9) 60.00; 1.361
- 10) 90.00; 1.151
- 11) 120.00; 1.021
- 12) 180.00; 0.919
- 13) 360.00; 0.714
- 14) 1440.00; 0.324

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10400.00 TO NODE 10401.00 IS CODE = 21  
-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 950.42  
ELEVATION DATA: UPSTREAM(FEET) = 2648.70 DOWNSTREAM(FEET) = 2536.15

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 16.799  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.792  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 5.89 0.30 1.000 0 16.80  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 13.21  
TOTAL AREA (ACRES) = 5.89 PEAK FLOW RATE (CFS) = 13.21

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10401.00 TO NODE 10402.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2536.15 DOWNSTREAM(FEET) = 2504.36  
CHANNEL LENGTH THRU SUBAREA(FEET) = 934.06 CHANNEL SLOPE = 0.0340  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.80  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.353  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN  
USER-DEFINED - 17.57 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 29.54  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.42  
AVERAGE FLOW DEPTH(FEET) = 0.75 TRAVEL TIME(MIN.) = 4.55  
Tc(MIN.) = 21.35  
SUBAREA AREA(ACRES) = 17.57 SUBAREA RUNOFF(CFS) = 32.46  
EFFECTIVE AREA(ACRES) = 23.46 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 23.5 PEAK FLOW RATE(CFS) = 43.34  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.94

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.94 FLOW VELOCITY(FEET/SEC.) = 3.88  
LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10402.00 = 1884.48 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10402.00 TO NODE 10402.50 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2504.36 DOWNSTREAM(FEET) = 2462.54  
CHANNEL LENGTH THRU SUBAREA(FEET) = 951.55 CHANNEL SLOPE = 0.0439  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.37

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.134

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	56.74	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 90.26

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.39

AVERAGE FLOW DEPTH(FEET) = 1.32 TRAVEL TIME(MIN.) = 2.94

Tc(MIN.) = 24.29

SUBAREA AREA(ACRES) = 56.74 SUBAREA RUNOFF(CFS) = 93.64

EFFECTIVE AREA(ACRES) = 80.20 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 80.2 PEAK FLOW RATE(CFS) = 132.36

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.65

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.65 FLOW VELOCITY(FEET/SEC.) = 6.05

LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10402.50 = 2836.03 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10402.50 TO NODE 10403.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2462.54 DOWNSTREAM(FEET) = 2433.59  
CHANNEL LENGTH THRU SUBAREA(FEET) = 967.41 CHANNEL SLOPE = 0.0299  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.22

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.999

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	68.01	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 184.39

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.85

AVERAGE FLOW DEPTH(FEET) = 2.19 TRAVEL TIME(MIN.) = 2.76

Tc(MIN.) = 27.05

SUBAREA AREA(ACRES) = 68.01 SUBAREA RUNOFF(CFS) = 104.02

EFFECTIVE AREA(ACRES) = 148.21 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 148.2 PEAK FLOW RATE(CFS) = 226.69

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.45

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.45 FLOW VELOCITY(FEET/SEC.) = 6.20

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

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10403.00 TO NODE 10404.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2433.59 DOWNSTREAM(FEET) = 2239.33  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2934.12 CHANNEL SLOPE = 0.0662  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.88

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.821

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	301.25	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 433.27

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.91

AVERAGE FLOW DEPTH(FEET) = 2.80 TRAVEL TIME(MIN.) = 4.94

Tc(MIN.) = 31.99

SUBAREA AREA(ACRES) = 301.25 SUBAREA RUNOFF(CFS) = 412.51

EFFECTIVE AREA(ACRES) = 449.46 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 449.5 PEAK FLOW RATE(CFS) = 615.45

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.37

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.37 FLOW VELOCITY(FEET/SEC.) = 10.92

LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10404.00 = 6737.56 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10404.00 TO NODE 10405.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2239.33 DOWNSTREAM(FEET) = 2128.80  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2862.32 CHANNEL SLOPE = 0.0386  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.18

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.666

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	152.68	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 184.39

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.85

AVERAGE FLOW DEPTH(FEET) = 2.19 TRAVEL TIME(MIN.) = 2.76

Tc(MIN.) = 27.05

SUBAREA AREA(ACRES) = 68.01 SUBAREA RUNOFF(CFS) = 104.02

EFFECTIVE AREA(ACRES) = 148.21 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 148.2 PEAK FLOW RATE(CFS) = 226.69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 709.34  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.35  
 AVERAGE FLOW DEPTH(FEET) = 4.15 TRAVEL TIME(MIN.) = 5.10  
 Tc(MIN.) = 37.09  
 SUBAREA AREA(ACRES) = 152.68 SUBAREA RUNOFF(CFS) = 187.68  
 EFFECTIVE AREA(ACRES) = 602.14 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 602.1 PEAK FLOW RATE(CFS) = 740.17  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.24

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.24 FLOW VELOCITY(FEET/SEC.) = 9.45  
 LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10405.00 = 9599.88 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10405.00 TO NODE 10420.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2128.80 DOWNSTREAM(FEET) = 1759.52  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1966.12 CHANNEL SLOPE = 0.1878  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.99  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.608

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	139.70	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 822.40  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 17.29  
 AVERAGE FLOW DEPTH(FEET) = 2.98 TRAVEL TIME(MIN.) = 1.90  
 Tc(MIN.) = 38.99  
 SUBAREA AREA(ACRES) = 139.70 SUBAREA RUNOFF(CFS) = 164.46  
 EFFECTIVE AREA(ACRES) = 741.84 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 741.8 PEAK FLOW RATE(CFS) = 873.30  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.08

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.08 FLOW VELOCITY(FEET/SEC.) = 17.57  
 LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10420.00 = 11566.00 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10405.00 TO NODE 10420.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 38.99  
 RAINFALL INTENSITY(INCH/HR) = 1.61  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 741.84  
 TOTAL STREAM AREA(ACRES) = 741.84  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 873.30

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10410.00 TO NODE 10411.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 413.10  
 ELEVATION DATA: UPSTREAM(FEET) = 3217.26 DOWNSTREAM(FEET) = 3058.86

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.517  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 4.272  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	-	3.06	0.30	1.000	0	9.52

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 10.94  
 TOTAL AREA(ACRES) = 3.06 PEAK FLOW RATE(CFS) = 10.94

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10411.00 TO NODE 10412.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3058.86 DOWNSTREAM(FEET) = 2879.84  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 512.18 CHANNEL SLOPE = 0.3495  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.29  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.829

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	4.24	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 17.68  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.99  
 AVERAGE FLOW DEPTH(FEET) = 0.28 TRAVEL TIME(MIN.) = 1.42  
 Tc(MIN.) = 10.94  
 SUBAREA AREA(ACRES) = 4.24 SUBAREA RUNOFF(CFS) = 13.47  
 EFFECTIVE AREA(ACRES) = 7.30 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 7.3 PEAK FLOW RATE(CFS) = 23.18

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.33

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.33 FLOW VELOCITY (FEET/SEC.) = 6.69  
LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10412.00 = 925.28 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10412.00 TO NODE 10413.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2879.84 DOWNSTREAM (FEET) = 2644.97  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1944.24 CHANNEL SLOPE = 0.1208  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.05  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.942

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 47.95 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 80.86  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.30  
AVERAGE FLOW DEPTH (FEET) = 0.93 TRAVEL TIME (MIN.) = 4.44  
Tc (MIN.) = 15.38  
SUBAREA AREA (ACRES) = 47.95 SUBAREA RUNOFF (CFS) = 114.00  
EFFECTIVE AREA (ACRES) = 55.25 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 55.2 PEAK FLOW RATE (CFS) = 131.36  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.23

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.23 FLOW VELOCITY (FEET/SEC.) = 8.55  
LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10413.00 = 2869.52 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10413.00 TO NODE 10414.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2644.97 DOWNSTREAM (FEET) = 2550.42  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2019.61 CHANNEL SLOPE = 0.0468  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.58  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.482

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 151.60 0.30 1.000 -

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 281.15  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.75  
AVERAGE FLOW DEPTH (FEET) = 2.44 TRAVEL TIME (MIN.) = 4.34  
Tc (MIN.) = 19.72  
SUBAREA AREA (ACRES) = 151.60 SUBAREA RUNOFF (CFS) = 297.74  
EFFECTIVE AREA (ACRES) = 206.85 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 206.9 PEAK FLOW RATE (CFS) = 406.25  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.96

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 2.96 FLOW VELOCITY (FEET/SEC.) = 8.60  
LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10414.00 = 4889.13 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10414.00 TO NODE 10415.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2550.42 DOWNSTREAM (FEET) = 2391.31  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1916.76 CHANNEL SLOPE = 0.0830  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.15  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.271

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 206.03 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 589.15  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.72  
AVERAGE FLOW DEPTH (FEET) = 3.10 TRAVEL TIME (MIN.) = 2.73  
Tc (MIN.) = 22.45  
SUBAREA AREA (ACRES) = 206.03 SUBAREA RUNOFF (CFS) = 365.43  
EFFECTIVE AREA (ACRES) = 412.88 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 412.9 PEAK FLOW RATE (CFS) = 732.31  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.47

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 3.47 FLOW VELOCITY (FEET/SEC.) = 12.44  
LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10415.00 = 6805.89 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10415.00 TO NODE 10416.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2391.31 DOWNSTREAM(FEET) = 2092.16  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2843.10 CHANNEL SLOPE = 0.1052  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.51  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.048  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 122.38 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 828.62  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.03  
 AVERAGE FLOW DEPTH(FEET) = 3.48 TRAVEL TIME(MIN.) = 3.38  
 Tc(MIN.) = 25.83  
 SUBAREA AREA(ACRES) = 122.38 SUBAREA RUNOFF(CFS) = 192.54  
 EFFECTIVE AREA(ACRES) = 535.26 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 535.3 PEAK FLOW RATE(CFS) = 842.12  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.51  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.51 FLOW VELOCITY(FEET/SEC.) = 14.08  
 LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10416.00 = 9648.99 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10416.00 TO NODE 10420.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 2092.16 DOWNSTREAM(FEET) = 1759.52  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2151.95 CHANNEL SLOPE = 0.1546  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.27  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.961  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 59.94 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 886.93  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.45  
 AVERAGE FLOW DEPTH(FEET) = 3.26 TRAVEL TIME(MIN.) = 2.18  
 Tc(MIN.) = 28.01  
 SUBAREA AREA(ACRES) = 59.94 SUBAREA RUNOFF(CFS) = 89.62  
 EFFECTIVE AREA(ACRES) = 595.20 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 595.2 PEAK FLOW RATE(CFS) = 889.94  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.27

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.27 FLOW VELOCITY(FEET/SEC.) = 16.45  
 LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10420.00 = 11800.94 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10416.00 TO NODE 10420.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<  
 =====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 28.01  
 RAINFALL INTENSITY (INCH/HR) = 1.96  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 595.20  
 TOTAL STREAM AREA(ACRES) = 595.20  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 889.94

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	873.30	38.99	1.608	0.30( 0.30)	1.00	741.8	10400.00
2	889.94	28.01	1.961	0.30( 0.30)	1.00	595.2	10410.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1686.83	28.01	1.961	0.30( 0.30)	1.00	1128.2	10410.00
2	1573.98	38.99	1.608	0.30( 0.30)	1.00	1337.0	10400.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 1686.83 Tc(MIN.) = 28.01  
 EFFECTIVE AREA(ACRES) = 1128.16 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 1337.0  
 LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10420.00 = 11800.94 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10420.00 TO NODE 10507.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 1759.52 DOWNSTREAM(FEET) = 1688.35  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2477.21 CHANNEL SLOPE = 0.0287  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 6.89  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.824  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

USER-DEFINED - 72.64 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1736.65  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.61  
 AVERAGE FLOW DEPTH (FEET) = 6.89 TRAVEL TIME (MIN.) = 3.89  
 Tc (MIN.) = 31.90  
 SUBAREA AREA (ACRES) = 72.64 SUBAREA RUNOFF (CFS) = 99.64  
 EFFECTIVE AREA (ACRES) = 1200.80 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 1409.7 PEAK FLOW RATE (CFS) = 1686.83  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.79

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 6.79 FLOW VELOCITY (FEET/SEC.) = 10.52  
 LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10507.00 = 14278.15 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10420.00 TO NODE 10507.00 IS CODE = 10

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

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10332.00 TO NODE 10332.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<<

PEAK FLOWRATE TABLE FILE NAME: S3.DNA  
 MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6184.75	42.15	0.30 ( 0.30)	1.00	5355.9	10200.00
2	6334.23	47.76	0.30 ( 0.30)	1.00	5935.2	10300.00
3	6332.85	47.93	0.30 ( 0.30)	1.00	5947.9	10320.00
4	6216.98	52.30	0.30 ( 0.30)	1.00	6139.8	10210.00
5	5932.27	77.08	0.30 ( 0.30)	1.00	6836.4	10100.00
TOTAL AREA (ACRES) =						6836.4

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10332.00 TO NODE 10332.00 IS CODE = 14.0

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6184.75	42.15	0.30 ( 0.30)	1.00	5355.9	10200.00
2	6334.23	47.76	0.30 ( 0.30)	1.00	5935.2	10300.00
3	6332.85	47.93	0.30 ( 0.30)	1.00	5947.9	10320.00
4	6216.98	52.30	0.30 ( 0.30)	1.00	6139.8	10210.00
5	5932.27	77.08	0.30 ( 0.30)	1.00	6836.4	10100.00
TOTAL AREA (ACRES) =						6836.4

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10332.00 TO NODE 10507.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 1739.96 DOWNSTREAM (FEET) = 1688.35  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2238.93 CHANNEL SLOPE = 0.0231  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 9.05  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.412

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	61.93	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 6365.22  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.32  
 AVERAGE FLOW DEPTH (FEET) = 9.05 TRAVEL TIME (MIN.) = 3.03  
 Tc (MIN.) = 50.79

SUBAREA AREA (ACRES) = 61.93 SUBAREA RUNOFF (CFS) = 61.97  
 EFFECTIVE AREA (ACRES) = 5997.10 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 6898.3 PEAK FLOW RATE (CFS) = 6334.23  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 9.02

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 9.02 FLOW VELOCITY (FEET/SEC.) = 12.30  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10507.00 = 35292.37 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10420.00 TO NODE 10507.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6184.75	45.20	1.493	0.30 ( 0.30)	1.00	5417.8	10200.00
2	6334.23	50.79	1.412	0.30 ( 0.30)	1.00	5997.1	10300.00
3	6332.85	50.97	1.411	0.30 ( 0.30)	1.00	6009.8	10320.00
4	6216.98	55.34	1.387	0.30 ( 0.30)	1.00	6201.7	10210.00
5	5932.27	80.16	1.220	0.30 ( 0.30)	1.00	6898.3	10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10507.00 =							35292.37 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1686.83	31.90	1.824	0.30 ( 0.30)	1.00	1200.8	10410.00
2	1573.98	42.95	1.529	0.30 ( 0.30)	1.00	1409.7	10400.00
LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10507.00 =							14278.15 FEET.



\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7260.79	31.90	1.824	0.30 ( 0.30)	1.00	5024.1	10410.00
2	7629.15	42.95	1.529	0.30 ( 0.30)	1.00	6557.7	10400.00
3	7712.33	45.20	1.493	0.30 ( 0.30)	1.00	6827.5	10200.00
4	7757.45	50.79	1.412	0.30 ( 0.30)	1.00	7406.8	10300.00
5	7754.81	50.97	1.411	0.30 ( 0.30)	1.00	7419.5	10320.00
6	7608.13	55.34	1.387	0.30 ( 0.30)	1.00	7611.4	10210.00
7	7109.95	80.16	1.220	0.30 ( 0.30)	1.00	8308.0	10100.00
TOTAL AREA (ACRES) =		8308.0					

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 7757.45 Tc(MIN.) = 50.786  
 EFFECTIVE AREA(ACRES) = 7406.78 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 8308.0  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10507.00 = 35292.37 FEET.

=====  
 END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 8308.0 TC(MIN.) = 50.79  
 EFFECTIVE AREA(ACRES) = 7406.78 AREA-AVERAGED Fm(INCH/HR)= 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.998  
 PEAK FLOW RATE(CFS) = 7757.45

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7260.79	31.90	1.824	0.30 ( 0.30)	1.00	5024.1	10410.00
2	7629.15	42.95	1.529	0.30 ( 0.30)	1.00	6557.7	10400.00
3	7712.33	45.20	1.493	0.30 ( 0.30)	1.00	6827.5	10200.00
4	7757.45	50.79	1.412	0.30 ( 0.30)	1.00	7406.8	10300.00
5	7754.81	50.97	1.411	0.30 ( 0.30)	1.00	7419.5	10320.00
6	7608.13	55.34	1.387	0.30 ( 0.30)	1.00	7611.4	10210.00
7	7109.95	80.16	1.220	0.30 ( 0.30)	1.00	8308.0	10100.00

=====  
 END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

-----  
FILE NAME: S5.DAT  
TIME/DATE OF STUDY: 10:05 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.582
- 2) 10.00; 4.025
- 3) 15.00; 2.982
- 4) 20.00; 2.453
- 5) 25.00; 2.081
- 6) 30.00; 1.882
- 7) 40.00; 1.577
- 8) 50.00; 1.416
- 9) 60.00; 1.361
- 10) 90.00; 1.151
- 11) 120.00; 1.021
- 12) 180.00; 0.919
- 13) 360.00; 0.714
- 14) 1440.00; 0.324

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10500.00 TO NODE 10501.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 295.64  
ELEVATION DATA: UPSTREAM(FEET) = 3108.31 DOWNSTREAM(FEET) = 3060.24

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 6.565  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 5.781  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)  
RESIDENTIAL  
"1 DWELLING/ACRE" - 1.54 0.30 0.910 0 6.57  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.910  
SUBAREA RUNOFF(CFS) = 7.63  
TOTAL AREA(ACRES) = 1.54 PEAK FLOW RATE(CFS) = 7.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10501.00 TO NODE 10502.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3060.24 DOWNSTREAM(FEET) = 2942.64  
CHANNEL LENGTH THRU SUBAREA(FEET) = 690.48 CHANNEL SLOPE = 0.1703  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.45  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 4.685  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN  
USER-DEFINED - 8.27 0.30 0.943 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.943  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 24.23  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.37  
AVERAGE FLOW DEPTH(FEET) = 0.42 TRAVEL TIME(MIN.) = 2.14  
Tc(MIN.) = 8.71  
SUBAREA AREA(ACRES) = 8.27 SUBAREA RUNOFF(CFS) = 32.77  
EFFECTIVE AREA(ACRES) = 9.81 AREA-AVERAGED Fm(INCH/HR) = 0.28  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.94  
TOTAL AREA(ACRES) = 9.8 PEAK FLOW RATE(CFS) = 38.88  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.55

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.55 FLOW VELOCITY(FEET/SEC.) = 6.34  
LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10502.00 = 986.12 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10502.00 TO NODE 10503.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2942.64 DOWNSTREAM(FEET) = 2815.24  
CHANNEL LENGTH THRU SUBAREA(FEET) = 957.31 CHANNEL SLOPE = 0.1331  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.88

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.828

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.91	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 69.03

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.15

AVERAGE FLOW DEPTH(FEET) = 0.83 TRAVEL TIME(MIN.) = 2.23

Tc(MIN.) = 10.94

SUBAREA AREA(ACRES) = 18.91 SUBAREA RUNOFF(CFS) = 60.05

EFFECTIVE AREA(ACRES) = 28.72 AREA-AVERAGED Fm(INCH/HR) = 0.29

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98

TOTAL AREA(ACRES) = 28.7 PEAK FLOW RATE(CFS) = 91.37

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.97

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.97 FLOW VELOCITY(FEET/SEC.) = 7.85

LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10503.00 = 1943.43 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10503.00 TO NODE 10504.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2815.24 DOWNSTREAM(FEET) = 2202.44  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2096.20 CHANNEL SLOPE = 0.2923  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.26

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.270

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	75.49	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 192.84

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.05

AVERAGE FLOW DEPTH(FEET) = 1.19 TRAVEL TIME(MIN.) = 2.68

Tc(MIN.) = 13.62

SUBAREA AREA(ACRES) = 75.49 SUBAREA RUNOFF(CFS) = 201.79

EFFECTIVE AREA(ACRES) = 104.21 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99

TOTAL AREA(ACRES) = 104.2 PEAK FLOW RATE(CFS) = 278.72

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.47

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.47 FLOW VELOCITY(FEET/SEC.) = 14.68

LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10504.00 = 4039.63 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10504.00 TO NODE 10505.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2202.44 DOWNSTREAM(FEET) = 1969.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2800.32 CHANNEL SLOPE = 0.0834  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.26

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.706

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	278.21	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 581.58

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.70

AVERAGE FLOW DEPTH(FEET) = 3.08 TRAVEL TIME(MIN.) = 3.99

Tc(MIN.) = 17.61

SUBAREA AREA(ACRES) = 278.21 SUBAREA RUNOFF(CFS) = 602.44

EFFECTIVE AREA(ACRES) = 382.42 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 382.4 PEAK FLOW RATE(CFS) = 828.26

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.70

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.70 FLOW VELOCITY(FEET/SEC.) = 12.89

LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10505.00 = 6839.95 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10505.00 TO NODE 10506.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1969.00 DOWNSTREAM(FEET) = 1759.23  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2892.99 CHANNEL SLOPE = 0.0725  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.57

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.361

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	323.47	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1128.83  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.32  
 AVERAGE FLOW DEPTH(FEET) = 4.47 TRAVEL TIME(MIN.) = 3.62  
 Tc(MIN.) = 21.23  
 SUBAREA AREA(ACRES) = 323.47 SUBAREA RUNOFF(CFS) = 600.17  
 EFFECTIVE AREA(ACRES) = 705.89 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 705.9 PEAK FLOW RATE(CFS) = 1309.88  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.81

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.81 FLOW VELOCITY(FEET/SEC.) = 13.87  
 LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10506.00 = 9732.94 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10506.00 TO NODE 10507.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 1759.23 DOWNSTREAM(FEET) = 1688.35  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2597.28 CHANNEL SLOPE = 0.0273  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 6.52  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.058

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	212.34	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1477.99  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.98  
 AVERAGE FLOW DEPTH(FEET) = 6.46 TRAVEL TIME(MIN.) = 4.34  
 Tc(MIN.) = 25.57  
 SUBAREA AREA(ACRES) = 212.34 SUBAREA RUNOFF(CFS) = 336.07  
 EFFECTIVE AREA(ACRES) = 918.23 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 918.2 PEAK FLOW RATE(CFS) = 1453.45  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 6.41

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 6.41 FLOW VELOCITY(FEET/SEC.) = 9.93  
 LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10507.00 = 12330.22 FEET.

-----  
 END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 918.2 TC(MIN.) = 25.57  
 EFFECTIVE AREA(ACRES) = 918.23 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.999  
 PEAK FLOW RATE(CFS) = 1453.45  
 -----

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

Analysis prepared by:

-----  
FILE NAME: S6.DAT  
TIME/DATE OF STUDY: 10:05 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.496
- 2) 10.00; 3.984
- 3) 15.00; 2.958
- 4) 20.00; 2.436
- 5) 25.00; 2.069
- 6) 30.00; 1.871
- 7) 40.00; 1.568
- 8) 50.00; 1.408
- 9) 60.00; 1.349
- 10) 90.00; 1.140
- 11) 120.00; 1.010
- 12) 180.00; 0.906
- 13) 360.00; 0.702
- 14) 1440.00; 0.318

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10600.00 TO NODE 10601.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 312.13  
ELEVATION DATA: UPSTREAM(FEET) = 3250.51 DOWNSTREAM(FEET) = 3126.78

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.451  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 4.762

SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)

NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 2.47 0.30 1.000 0 8.45  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 9.92  
TOTAL AREA (ACRES) = 2.47 PEAK FLOW RATE (CFS) = 9.92

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10601.00 TO NODE 10602.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3126.78 DOWNSTREAM(FEET) = 2951.30  
CHANNEL LENGTH THRU SUBAREA(FEET) = 620.40 CHANNEL SLOPE = 0.2828  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.35  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.948

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN

USER-DEFINED - 6.58 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.76  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.99  
AVERAGE FLOW DEPTH(FEET) = 0.33 TRAVEL TIME(MIN.) = 1.73  
Tc(MIN.) = 10.18

SUBAREA AREA(ACRES) = 6.58 SUBAREA RUNOFF(CFS) = 21.60  
EFFECTIVE AREA(ACRES) = 9.05 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 9.1 PEAK FLOW RATE(CFS) = 29.71  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.41

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.41 FLOW VELOCITY(FEET/SEC.) = 6.75  
LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10602.00 = 932.53 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10602.00 TO NODE 10603.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2951.30 DOWNSTREAM(FEET) = 2641.28  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1930.18 CHANNEL SLOPE = 0.1606  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.13

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.206

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	60.78	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 110.24

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.90

AVERAGE FLOW DEPTH(FEET) = 1.03 TRAVEL TIME(MIN.) = 3.61

Tc(MIN.) = 13.79

SUBAREA AREA(ACRES) = 60.78 SUBAREA RUNOFF(CFS) = 158.99

EFFECTIVE AREA(ACRES) = 69.83 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 69.8 PEAK FLOW RATE(CFS) = 182.67

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.37

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.37 FLOW VELOCITY(FEET/SEC.) = 10.46

LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10603.00 = 2862.71 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10603.00 TO NODE 10604.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2641.28 DOWNSTREAM(FEET) = 2318.61  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1966.90 CHANNEL SLOPE = 0.1640  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.70

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.793

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	68.78	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 259.97

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.75

AVERAGE FLOW DEPTH(FEET) = 1.66 TRAVEL TIME(MIN.) = 2.79

Tc(MIN.) = 16.58

SUBAREA AREA(ACRES) = 68.78 SUBAREA RUNOFF(CFS) = 154.34

EFFECTIVE AREA(ACRES) = 138.61 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 138.6 PEAK FLOW RATE(CFS) = 311.04

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.83

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.83 FLOW VELOCITY(FEET/SEC.) = 12.41

LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10604.00 = 4829.61 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10604.00 TO NODE 10605.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2318.61 DOWNSTREAM(FEET) = 1983.94  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2601.81 CHANNEL SLOPE = 0.1286  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.56

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.444

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	178.16	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 483.43

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.96

AVERAGE FLOW DEPTH(FEET) = 2.49 TRAVEL TIME(MIN.) = 3.35

Tc(MIN.) = 19.92

SUBAREA AREA(ACRES) = 178.16 SUBAREA RUNOFF(CFS) = 343.78

EFFECTIVE AREA(ACRES) = 316.77 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 316.8 PEAK FLOW RATE(CFS) = 611.24

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.82

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.82 FLOW VELOCITY(FEET/SEC.) = 13.86

LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10605.00 = 7431.42 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10605.00 TO NODE 10620.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1983.94 DOWNSTREAM(FEET) = 1655.24  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2439.06 CHANNEL SLOPE = 0.1348  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.92

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.235

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	61.31	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 664.64  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 14.44  
 AVERAGE FLOW DEPTH( FEET) = 2.91 TRAVEL TIME( MIN.) = 2.82  
 Tc( MIN.) = 22.74  
 SUBAREA AREA( ACRES) = 61.31 SUBAREA RUNOFF( CFS) = 106.77  
 EFFECTIVE AREA( ACRES) = 378.08 AREA-AVERAGED Fm( INCH/HR) = 0.30  
 AREA-AVERAGED Fp( INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA( ACRES) = 378.1 PEAK FLOW RATE( CFS) = 658.43  
 GIVEN CHANNEL BASE( FEET) = 10.00 CHANNEL FREEBOARD( FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT( FEET) = 2.90

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH( FEET) = 2.90 FLOW VELOCITY( FEET/SEC.) = 14.39  
 LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10620.00 = 9870.48 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10605.00 TO NODE 10620.00 IS CODE = 10  
 -----

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

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10420.00 TO NODE 10507.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S4.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7260.79	31.90	0.30( 0.30)	1.00	5024.1	10410.00
2	7629.15	42.95	0.30( 0.30)	1.00	6557.7	10400.00
3	7712.33	45.20	0.30( 0.30)	1.00	6827.5	10200.00
4	7757.45	50.79	0.30( 0.30)	1.00	7406.8	10300.00
5	7754.81	50.97	0.30( 0.30)	1.00	7419.5	10320.00
6	7608.13	55.34	0.30( 0.30)	1.00	7611.4	10210.00
7	7109.95	80.16	0.30( 0.30)	1.00	8308.0	10100.00
TOTAL AREA( ACRES) =						8308.0

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10506.00 TO NODE 10507.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S5.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1453.45	25.57	0.30( 0.30)	1.00	918.2	10500.00
TOTAL AREA( ACRES) =						918.2

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10506.00 TO NODE 10507.00 IS CODE = 14.0  
 -----

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1453.45	25.57	0.30( 0.30)	1.00	918.2	10500.00
TOTAL AREA( ACRES) =						918.2

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10420.00 TO NODE 10507.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1453.45	25.57	2.047	0.30( 0.30)	1.00	918.2	10500.00
LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10507.00 = 12330.22 FEET.							

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7260.79	31.90	1.813	0.30( 0.30)	1.00	5024.1	10410.00
2	7629.15	42.95	1.521	0.30( 0.30)	1.00	6557.7	10400.00
3	7712.33	45.20	1.485	0.30( 0.30)	1.00	6827.5	10200.00
4	7757.45	50.79	1.403	0.30( 0.30)	1.00	7406.8	10300.00
5	7754.81	50.97	1.402	0.30( 0.30)	1.00	7419.5	10320.00
6	7608.13	55.34	1.376	0.30( 0.30)	1.00	7611.4	10210.00
7	7109.95	80.16	1.209	0.30( 0.30)	1.00	8308.0	10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10507.00 = 35292.37 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8168.66	25.57	2.047	0.30( 0.30)	1.00	4944.6	10500.00
2	8520.22	31.90	1.813	0.30( 0.30)	1.00	5942.3	10410.00
3	8645.06	42.95	1.521	0.30( 0.30)	1.00	7475.9	10400.00
4	8698.28	45.20	1.485	0.30( 0.30)	1.00	7745.7	10200.00
5	8675.70	50.79	1.403	0.30( 0.30)	1.00	8325.0	10300.00
6	8672.18	50.97	1.402	0.30( 0.30)	1.00	8337.7	10320.00
7	8504.02	55.34	1.376	0.30( 0.30)	1.00	8529.6	10210.00
8	7866.11	80.16	1.209	0.30( 0.30)	1.00	9226.2	10100.00
TOTAL AREA( ACRES) = 9226.2							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE( CFS) = 8698.28 Tc( MIN.) = 45.205  
 EFFECTIVE AREA( ACRES) = 7745.72 AREA-AVERAGED Fm( INCH/HR) = 0.30  
 AREA-AVERAGED Fp( INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA( ACRES) = 9226.2  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10507.00 = 35292.37 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10507.00 TO NODE 10620.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1688.35 DOWNSTREAM(FEET) = 1655.24  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2570.61 CHANNEL SLOPE = 0.0129  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 12.16  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.421

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 83.74 0.30 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8740.54  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.82  
 AVERAGE FLOW DEPTH(FEET) = 12.15 TRAVEL TIME(MIN.) = 3.96  
 Tc(MIN.) = 49.16

SUBAREA AREA(ACRES) = 83.74 SUBAREA RUNOFF(CFS) = 84.52  
 EFFECTIVE AREA(ACRES) = 7829.46 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 9310.0 PEAK FLOW RATE(CFS) = 8698.28

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 12.12

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 12.12 FLOW VELOCITY(FEET/SEC.) = 10.81  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10620.00 = 37862.98 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10605.00 TO NODE 10620.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<  
 =====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8168.66	29.59	1.887	0.30( 0.30)	1.00	5028.3	10500.00
2	8520.22	35.88	1.693	0.30( 0.30)	1.00	6026.0	10410.00
3	8645.06	46.92	1.457	0.30( 0.30)	1.00	7559.7	10400.00
4	8698.28	49.16	1.421	0.30( 0.30)	1.00	7829.5	10200.00
5	8675.70	54.75	1.380	0.30( 0.30)	1.00	8408.7	10300.00
6	8672.18	54.93	1.379	0.30( 0.30)	1.00	8421.5	10320.00
7	8504.02	59.32	1.353	0.30( 0.30)	1.00	8613.4	10210.00
8	7866.11	84.23	1.180	0.30( 0.30)	1.00	9310.0	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10620.00 = 37862.98 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	658.43	22.74	2.235	0.30( 0.30)	1.00	378.1	10600.00

LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10620.00 = 9870.48 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8310.84	22.74	2.235	0.30( 0.30)	1.00	4242.7	10600.00

2	8708.82	29.59	1.887	0.30( 0.30)	1.00	5406.4	10500.00
3	8994.22	35.88	1.693	0.30( 0.30)	1.00	6404.1	10410.00
4	9038.88	46.92	1.457	0.30( 0.30)	1.00	7937.8	10400.00
5	9079.88	49.16	1.421	0.30( 0.30)	1.00	8207.5	10200.00
6	9043.22	54.75	1.380	0.30( 0.30)	1.00	8786.8	10300.00
7	9039.33	54.93	1.379	0.30( 0.30)	1.00	8799.5	10320.00
8	8862.35	59.32	1.353	0.30( 0.30)	1.00	8991.5	10210.00
9	8165.64	84.23	1.180	0.30( 0.30)	1.00	9688.1	10100.00

TOTAL AREA(ACRES) = 9688.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 9079.88 Tc(MIN.) = 49.163  
 EFFECTIVE AREA(ACRES) = 8207.54 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 9688.1  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10620.00 = 37862.98 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10620.00 TO NODE 10621.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 1655.24 DOWNSTREAM(FEET) = 1584.84  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2294.47 CHANNEL SLOPE = 0.0307  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 10.14  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.398

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 342.43 0.30 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9249.09  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.12  
 AVERAGE FLOW DEPTH(FEET) = 10.13 TRAVEL TIME(MIN.) = 2.53  
 Tc(MIN.) = 51.69

SUBAREA AREA(ACRES) = 342.43 SUBAREA RUNOFF(CFS) = 338.42  
 EFFECTIVE AREA(ACRES) = 8549.97 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 10030.5 PEAK FLOW RATE(CFS) = 9079.88  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 10.04

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 10.04 FLOW VELOCITY(FEET/SEC.) = 15.05  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10621.00 = 40157.45 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10621.00 TO NODE 10640.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====



ELEVATION DATA: UPSTREAM(FEET) = 1584.84 DOWNSTREAM(FEET) = 1443.87  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2923.79 CHANNEL SLOPE = 0.0482  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 9.03  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.382  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	160.90	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9158.22  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 17.79  
 AVERAGE FLOW DEPTH(FEET) = 9.02 TRAVEL TIME(MIN.) = 2.74  
 Tc(MIN.) = 54.43  
 SUBAREA AREA(ACRES) = 160.90 SUBAREA RUNOFF(CFS) = 156.67  
 EFFECTIVE AREA(ACRES) = 8710.87 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 10191.4 PEAK FLOW RATE(CFS) = 9079.88  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 8.98

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 8.98 FLOW VELOCITY(FEET/SEC.) = 17.74  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10640.00 = 43081.24 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10621.00 TO NODE 10640.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

-----  
 TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 54.43  
 RAINFALL INTENSITY(INCH/HR) = 1.38  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 8710.87  
 TOTAL STREAM AREA(ACRES) = 10191.39  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 9079.88

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10630.00 TO NODE 10631.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 298.79  
 ELEVATION DATA: UPSTREAM(FEET) = 3257.00 DOWNSTREAM(FEET) = 3147.13

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.430  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 4.773  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	1.25	0.30	1.000	0	8.43

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 5.03  
 TOTAL AREA(ACRES) = 1.25 PEAK FLOW RATE(CFS) = 5.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10631.00 TO NODE 10632.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 3147.13 DOWNSTREAM(FEET) = 2774.29  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 640.96 CHANNEL SLOPE = 0.5817  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.22  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 3.950  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	4.75	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.87  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.15  
 AVERAGE FLOW DEPTH(FEET) = 0.20 TRAVEL TIME(MIN.) = 1.74  
 Tc(MIN.) = 10.17  
 SUBAREA AREA(ACRES) = 4.75 SUBAREA RUNOFF(CFS) = 15.60  
 EFFECTIVE AREA(ACRES) = 6.00 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 6.0 PEAK FLOW RATE(CFS) = 19.71  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.26  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.26 FLOW VELOCITY(FEET/SEC.) = 7.31  
 LONGEST FLOWPATH FROM NODE 10630.00 TO NODE 10632.00 = 939.75 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10632.00 TO NODE 10633.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 2774.29 DOWNSTREAM(FEET) = 2004.58  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1905.65 CHANNEL SLOPE = 0.4039  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.94  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 3.443  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
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USER-DEFINED          -      79.75      0.30      1.000      -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 133.28
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.87
AVERAGE FLOW DEPTH (FEET) = 0.88 TRAVEL TIME (MIN.) = 2.47
Tc (MIN.) = 12.63
SUBAREA AREA (ACRES) = 79.75 SUBAREA RUNOFF (CFS) = 225.62
EFFECTIVE AREA (ACRES) = 85.75 AREA-AVERAGED Fm (INCH/HR) = 0.30
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA (ACRES) = 85.8 PEAK FLOW RATE (CFS) = 242.59
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT (FEET) = 1.24

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH (FEET) = 1.24 FLOW VELOCITY (FEET/SEC.) = 15.69
LONGEST FLOWPATH FROM NODE 10630.00 TO NODE 10633.00 = 2845.40 FEET.

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*****
FLOW PROCESS FROM NODE 10633.00 TO NODE 10634.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

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=====
ELEVATION DATA: UPSTREAM (FEET) = 2004.58 DOWNSTREAM (FEET) = 1714.99
CHANNEL LENGTH THRU SUBAREA (FEET) = 1868.05 CHANNEL SLOPE = 0.1550
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT (FEET) = 2.19
* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.956
SUBAREA LOSS RATE DATA (AMC II):

```

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	124.45	0.30	1.000	-

```

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 391.68
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 13.05
AVERAGE FLOW DEPTH (FEET) = 2.11 TRAVEL TIME (MIN.) = 2.39
Tc (MIN.) = 15.02
SUBAREA AREA (ACRES) = 124.45 SUBAREA RUNOFF (CFS) = 297.48
EFFECTIVE AREA (ACRES) = 210.20 AREA-AVERAGED Fm (INCH/HR) = 0.30
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA (ACRES) = 210.2 PEAK FLOW RATE (CFS) = 502.45
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT (FEET) = 2.42

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH (FEET) = 2.42 FLOW VELOCITY (FEET/SEC.) = 14.02
LONGEST FLOWPATH FROM NODE 10630.00 TO NODE 10634.00 = 4713.45 FEET.

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*****
FLOW PROCESS FROM NODE 10634.00 TO NODE 10640.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

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```

=====
ELEVATION DATA: UPSTREAM (FEET) = 1714.99 DOWNSTREAM (FEET) = 1443.87
CHANNEL LENGTH THRU SUBAREA (FEET) = 1685.34 CHANNEL SLOPE = 0.1609
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT (FEET) = 2.52
* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.755
SUBAREA LOSS RATE DATA (AMC II):

```

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	42.00	0.30	1.000	-

```

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 548.84
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 14.58
AVERAGE FLOW DEPTH (FEET) = 2.51 TRAVEL TIME (MIN.) = 1.93
Tc (MIN.) = 16.95
SUBAREA AREA (ACRES) = 42.00 SUBAREA RUNOFF (CFS) = 92.79
EFFECTIVE AREA (ACRES) = 252.20 AREA-AVERAGED Fm (INCH/HR) = 0.30
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA (ACRES) = 252.2 PEAK FLOW RATE (CFS) = 557.19
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT (FEET) = 2.53

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH (FEET) = 2.53 FLOW VELOCITY (FEET/SEC.) = 14.62
LONGEST FLOWPATH FROM NODE 10630.00 TO NODE 10640.00 = 6398.79 FEET.

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*****
FLOW PROCESS FROM NODE 10634.00 TO NODE 10640.00 IS CODE = 1
-----

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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

```

```

=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION (MIN.) = 16.95
RAINFALL INTENSITY (INCH/HR) = 2.75
AREA-AVERAGED Fm (INCH/HR) = 0.30
AREA-AVERAGED Fp (INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA (ACRES) = 252.20
TOTAL STREAM AREA (ACRES) = 252.20
PEAK FLOW RATE (CFS) AT CONFLUENCE = 557.19

```

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap (DECIMAL)	Ae (ACRES)	HEADWATER NODE
1	8310.84	28.12	1.945	0.30 ( 0.30)	1.00	4746.0	10600.00
1	8708.82	34.91	1.722	0.30 ( 0.30)	1.00	5909.8	10500.00
1	8994.22	41.16	1.550	0.30 ( 0.30)	1.00	6907.4	10410.00
1	9038.88	52.20	1.395	0.30 ( 0.30)	1.00	8441.1	10400.00
1	9079.88	54.43	1.382	0.30 ( 0.30)	1.00	8710.9	10200.00
1	9043.22	60.02	1.349	0.30 ( 0.30)	1.00	9290.2	10300.00
1	9039.33	60.20	1.348	0.30 ( 0.30)	1.00	9302.9	10320.00
1	8862.35	64.63	1.317	0.30 ( 0.30)	1.00	9494.8	10210.00
1	8165.64	89.65	1.142	0.30 ( 0.30)	1.00	10191.4	10100.00

2 557.19 16.95 2.755 0.30( 0.30) 1.00 252.2 10630.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8028.60	16.95	2.755	0.30( 0.30)	1.00	3112.3	10630.00
2	8684.32	28.12	1.945	0.30( 0.30)	1.00	4998.2	10600.00
3	9031.66	34.91	1.722	0.30( 0.30)	1.00	6162.0	10500.00
4	9277.85	41.16	1.550	0.30( 0.30)	1.00	7159.6	10410.00
5	9287.45	52.20	1.395	0.30( 0.30)	1.00	8693.3	10400.00
6	9325.46	54.43	1.382	0.30( 0.30)	1.00	8963.1	10200.00
7	9281.30	60.02	1.349	0.30( 0.30)	1.00	9542.4	10300.00
8	9277.13	60.20	1.348	0.30( 0.30)	1.00	9555.1	10320.00
9	9093.16	64.63	1.317	0.30( 0.30)	1.00	9747.0	10210.00
10	8356.87	89.65	1.142	0.30( 0.30)	1.00	10443.6	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 9325.46 Tc (MIN.) = 54.43  
EFFECTIVE AREA(ACRES) = 8963.07 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 10443.6  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10640.00 = 43081.24 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10640.00 TO NODE 10724.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1443.87 DOWNSTREAM(FEET) = 1320.32  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2254.45 CHANNEL SLOPE = 0.0548  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.85  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.370  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN  
USER-DEFINED - 94.37 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9370.90  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 18.76  
AVERAGE FLOW DEPTH(FEET) = 8.84 TRAVEL TIME(MIN.) = 2.00  
Tc(MIN.) = 56.43  
SUBAREA AREA(ACRES) = 94.37 SUBAREA RUNOFF(CFS) = 90.89  
EFFECTIVE AREA(ACRES) = 9057.44 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 10538.0 PEAK FLOW RATE(CFS) = 9325.46  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.82

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.82 FLOW VELOCITY(FEET/SEC.) = 18.72  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10724.00 = 45335.69 FEET.

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 10538.0 TC(MIN.) = 56.43  
EFFECTIVE AREA(ACRES) = 9057.44 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.999  
PEAK FLOW RATE(CFS) = 9325.46

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8028.60	19.03	2.537	0.30( 0.30)	1.00	3206.7	10630.00
2	8684.32	30.16	1.866	0.30( 0.30)	1.00	5092.6	10600.00
3	9031.66	36.93	1.661	0.30( 0.30)	1.00	6256.3	10500.00
4	9277.85	43.16	1.517	0.30( 0.30)	1.00	7254.0	10410.00
5	9287.45	54.20	1.383	0.30( 0.30)	1.00	8787.7	10400.00
6	9325.46	56.43	1.370	0.30( 0.30)	1.00	9057.4	10200.00
7	9281.30	62.03	1.335	0.30( 0.30)	1.00	9636.7	10300.00
8	9277.13	62.21	1.334	0.30( 0.30)	1.00	9649.4	10320.00
9	9093.16	66.64	1.303	0.30( 0.30)	1.00	9841.4	10210.00
10	8356.87	91.72	1.133	0.30( 0.30)	1.00	10538.0	10100.00

=====  
END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

-----  
FILE NAME: S7.DAT  
TIME/DATE OF STUDY: 10:06 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.496
- 2) 10.00; 3.984
- 3) 15.00; 2.958
- 4) 20.00; 2.436
- 5) 25.00; 2.069
- 6) 30.00; 1.871
- 7) 40.00; 1.568
- 8) 50.00; 1.408
- 9) 60.00; 1.349
- 10) 90.00; 1.140
- 11) 120.00; 1.010
- 12) 180.00; 0.906
- 13) 360.00; 0.702
- 14) 1440.00; 0.318

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10700.00 TO NODE 10701.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 281.18  
ELEVATION DATA: UPSTREAM(FEET) = 3512.68 DOWNSTREAM(FEET) = 3444.33

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.938  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 4.517  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" - 1.30 0.30 1.000 0 8.94  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 4.93  
TOTAL AREA (ACRES) = 1.30 PEAK FLOW RATE (CFS) = 4.93

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10701.00 TO NODE 10702.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3444.33 DOWNSTREAM(FEET) = 3246.68  
CHANNEL LENGTH THRU SUBAREA(FEET) = 700.05 CHANNEL SLOPE = 0.2823  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.29  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.750  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN  
USER-DEFINED - 6.49 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 15.07  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.30  
AVERAGE FLOW DEPTH(FEET) = 0.27 TRAVEL TIME(MIN.) = 2.20  
Tc(MIN.) = 11.14  
SUBAREA AREA(ACRES) = 6.49 SUBAREA RUNOFF(CFS) = 20.15  
EFFECTIVE AREA(ACRES) = 7.79 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 7.8 PEAK FLOW RATE(CFS) = 24.19  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.36

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.36 FLOW VELOCITY(FEET/SEC.) = 6.35  
LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10702.00 = 981.23 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10702.00 TO NODE 10703.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3246.68 DOWNSTREAM(FEET) = 3075.14  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1893.56 CHANNEL SLOPE = 0.0906  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.96

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.816

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	31.98	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 60.86

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.04

AVERAGE FLOW DEPTH(FEET) = 0.86 TRAVEL TIME(MIN.) = 5.22

Tc(MIN.) = 16.36

SUBAREA AREA(ACRES) = 31.98 SUBAREA RUNOFF(CFS) = 72.41

EFFECTIVE AREA(ACRES) = 39.77 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 39.8 PEAK FLOW RATE(CFS) = 90.05

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.08

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.08 FLOW VELOCITY(FEET/SEC.) = 6.87

LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10703.00 = 2874.79 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10703.00 TO NODE 10703.50 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3075.14 DOWNSTREAM(FEET) = 2952.03  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2060.61 CHANNEL SLOPE = 0.0597  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.49

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.319

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	34.58	0.30	0.872	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.872

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 122.17

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.56

AVERAGE FLOW DEPTH(FEET) = 1.44 TRAVEL TIME(MIN.) = 5.24

Tc(MIN.) = 21.60

SUBAREA AREA(ACRES) = 34.58 SUBAREA RUNOFF(CFS) = 64.03

EFFECTIVE AREA(ACRES) = 74.35 AREA-AVERAGED Fm(INCH/HR) = 0.28

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.94

TOTAL AREA(ACRES) = 74.4 PEAK FLOW RATE(CFS) = 136.29

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.54

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.54 FLOW VELOCITY(FEET/SEC.) = 6.79

LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10703.50 = 4935.40 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10703.50 TO NODE 10704.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2952.03 DOWNSTREAM(FEET) = 2895.59  
CHANNEL LENGTH THRU SUBAREA(FEET) = 930.70 CHANNEL SLOPE = 0.0606  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.70

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.161

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	30.69	0.30	0.951	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.951

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 162.20

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.21

AVERAGE FLOW DEPTH(FEET) = 1.68 TRAVEL TIME(MIN.) = 2.15

Tc(MIN.) = 23.75

SUBAREA AREA(ACRES) = 30.69 SUBAREA RUNOFF(CFS) = 51.81

EFFECTIVE AREA(ACRES) = 105.04 AREA-AVERAGED Fm(INCH/HR) = 0.28

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.94

TOTAL AREA(ACRES) = 105.0 PEAK FLOW RATE(CFS) = 177.52

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.77

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.77 FLOW VELOCITY(FEET/SEC.) = 7.39

LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10704.00 = 5866.10 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10704.00 TO NODE 10720.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2895.59 DOWNSTREAM(FEET) = 2581.07  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2585.44 CHANNEL SLOPE = 0.1217  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.11

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.968

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	199.40	0.30	0.977	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.977  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 328.06  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.35  
 AVERAGE FLOW DEPTH(FEET) = 2.05 TRAVEL TIME(MIN.) = 3.80  
 Tc(MIN.) = 27.54  
 SUBAREA AREA(ACRES) = 199.40 SUBAREA RUNOFF(CFS) = 300.64  
 EFFECTIVE AREA(ACRES) = 304.44 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 304.4 PEAK FLOW RATE(CFS) = 459.95  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.46

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.46 FLOW VELOCITY(FEET/SEC.) = 12.53  
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10720.00 = 8451.54 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10704.00 TO NODE 10720.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

-----  
 TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 27.54  
 RAINFALL INTENSITY(INCH/HR) = 1.97  
 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.97  
 EFFECTIVE STREAM AREA(ACRES) = 304.44  
 TOTAL STREAM AREA(ACRES) = 304.44  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 459.95

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10710.00 TO NODE 10711.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 943.64  
 ELEVATION DATA: UPSTREAM(FEET) = 3389.13 DOWNSTREAM(FEET) = 3276.30

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.438  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.689  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
PUBLIC PARK	-	7.76	0.30	0.981	0	11.44

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.981  
 SUBAREA RUNOFF(CFS) = 23.71  
 TOTAL AREA(ACRES) = 7.76 PEAK FLOW RATE(CFS) = 23.71

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10711.00 TO NODE 10712.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 3276.30 DOWNSTREAM(FEET) = 3152.26  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 950.69 CHANNEL SLOPE = 0.1305  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.75  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.188

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	22.39	0.30	0.988	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.988  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 52.99  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.49  
 AVERAGE FLOW DEPTH(FEET) = 0.71 TRAVEL TIME(MIN.) = 2.44  
 Tc(MIN.) = 13.88

SUBAREA AREA(ACRES) = 22.39 SUBAREA RUNOFF(CFS) = 58.27  
 EFFECTIVE AREA(ACRES) = 30.15 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 30.1 PEAK FLOW RATE(CFS) = 78.48  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.90

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.90 FLOW VELOCITY(FEET/SEC.) = 7.41  
 LONGEST FLOWPATH FROM NODE 10710.00 TO NODE 10712.00 = 1894.33 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10712.00 TO NODE 10713.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 3152.26 DOWNSTREAM(FEET) = 2879.03  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1909.77 CHANNEL SLOPE = 0.1431  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.19  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.702

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	42.59	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 124.68  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.91  
 AVERAGE FLOW DEPTH(FEET) = 1.14 TRAVEL TIME(MIN.) = 3.57  
 Tc(MIN.) = 17.45

SUBAREA AREA(ACRES) = 42.59 SUBAREA RUNOFF(CFS) = 92.08  
 EFFECTIVE AREA(ACRES) = 72.74 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 72.7 PEAK FLOW RATE(CFS) = 157.37  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.30

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.30 FLOW VELOCITY(FEET/SEC.) = 9.59  
LONGEST FLOWPATH FROM NODE 10710.00 TO NODE 10713.00 = 3804.10 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10713.00 TO NODE 10720.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2879.03 DOWNSTREAM(FEET) = 2581.07  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2621.96 CHANNEL SLOPE = 0.1136  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.09  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.327  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	156.72	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 300.76  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.82  
AVERAGE FLOW DEPTH(FEET) = 1.99 TRAVEL TIME(MIN.) = 4.04  
Tc(MIN.) = 21.49  
SUBAREA AREA(ACRES) = 156.72 SUBAREA RUNOFF(CFS) = 285.87  
EFFECTIVE AREA(ACRES) = 229.46 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 229.5 PEAK FLOW RATE(CFS) = 418.67  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.38

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.38 FLOW VELOCITY(FEET/SEC.) = 11.90  
LONGEST FLOWPATH FROM NODE 10710.00 TO NODE 10720.00 = 6426.06 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10713.00 TO NODE 10720.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION(MIN.) = 21.49  
RAINFALL INTENSITY(INCH/HR) = 2.33  
AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 229.46  
TOTAL STREAM AREA(ACRES) = 229.46  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 418.67

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	459.95	27.54	1.968	0.30( 0.29)	0.97	304.4	10700.00
2	418.67	21.49	2.327	0.30( 0.30)	1.00	229.5	10710.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	854.13	21.49	2.327	0.30( 0.29)	0.98	467.0	10710.00
2	804.60	27.54	1.968	0.30( 0.29)	0.98	533.9	10700.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 854.13 Tc(MIN.) = 21.49  
EFFECTIVE AREA(ACRES) = 466.98 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98  
TOTAL AREA(ACRES) = 533.9  
LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10720.00 = 8451.54 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10720.00 TO NODE 10720.50 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2581.07 DOWNSTREAM(FEET) = 2523.48  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1699.13 CHANNEL SLOPE = 0.0339  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.98  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.111  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	116.31	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 948.94  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.62  
AVERAGE FLOW DEPTH(FEET) = 4.95 TRAVEL TIME(MIN.) = 2.94  
Tc(MIN.) = 24.43  
SUBAREA AREA(ACRES) = 116.31 SUBAREA RUNOFF(CFS) = 189.54  
EFFECTIVE AREA(ACRES) = 583.29 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 650.2 PEAK FLOW RATE(CFS) = 952.87  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.96

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 4.96 FLOW VELOCITY(FEET/SEC.) = 9.63  
LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10720.50 = 10150.67 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10720.50 TO NODE 10721.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2523.48 DOWNSTREAM(FEET) = 2488.66  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1575.08 CHANNEL SLOPE = 0.0221  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.69

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.967

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	82.28	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1014.61

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.36

AVERAGE FLOW DEPTH(FEET) = 5.68 TRAVEL TIME(MIN.) = 3.14

Tc(MIN.) = 27.57

SUBAREA AREA(ACRES) = 82.28 SUBAREA RUNOFF(CFS) = 123.46

EFFECTIVE AREA(ACRES) = 665.57 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99

TOTAL AREA(ACRES) = 732.5 PEAK FLOW RATE(CFS) = 1001.03

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.64

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 5.64 FLOW VELOCITY(FEET/SEC.) = 8.34

LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10721.00 = 11725.75 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10721.00 TO NODE 10721.50 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2488.66 DOWNSTREAM(FEET) = 2453.35  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2032.11 CHANNEL SLOPE = 0.0174  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.51

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.816

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	259.52	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1178.11

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.96

AVERAGE FLOW DEPTH(FEET) = 6.46 TRAVEL TIME(MIN.) = 4.26

Tc(MIN.) = 31.83

SUBAREA AREA(ACRES) = 259.52 SUBAREA RUNOFF(CFS) = 354.02

EFFECTIVE AREA(ACRES) = 925.09 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99

TOTAL AREA(ACRES) = 992.0 PEAK FLOW RATE(CFS) = 1264.28

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.68

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 6.68 FLOW VELOCITY(FEET/SEC.) = 8.10

LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10721.50 = 13757.86 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10721.50 TO NODE 10722.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2453.35 DOWNSTREAM(FEET) = 2384.52  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1842.37 CHANNEL SLOPE = 0.0374  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.89

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.732

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	229.78	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1412.33

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.07

AVERAGE FLOW DEPTH(FEET) = 5.87 TRAVEL TIME(MIN.) = 2.77

Tc(MIN.) = 34.60

SUBAREA AREA(ACRES) = 229.78 SUBAREA RUNOFF(CFS) = 296.07

EFFECTIVE AREA(ACRES) = 1154.87 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99

TOTAL AREA(ACRES) = 1221.8 PEAK FLOW RATE(CFS) = 1490.36

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.02

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 6.02 FLOW VELOCITY(FEET/SEC.) = 11.23

LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10722.00 = 15600.23 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10722.00 TO NODE 10723.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2384.52 DOWNSTREAM(FEET) = 1925.64  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3780.37 CHANNEL SLOPE = 0.1214  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.80

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.625

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	308.58	0.30	1.000	-



SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1674.38  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 17.87  
 AVERAGE FLOW DEPTH(FEET) = 4.79 TRAVEL TIME(MIN.) = 3.53  
 Tc(MIN.) = 38.13  
 SUBAREA AREA(ACRES) = 308.58 SUBAREA RUNOFF(CFS) = 367.93  
 EFFECTIVE AREA(ACRES) = 1463.45 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 1530.4 PEAK FLOW RATE(CFS) = 1747.27  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.89

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.89 FLOW VELOCITY(FEET/SEC.) = 18.08  
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10723.00 = 19380.60 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10723.00 TO NODE 10724.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 1925.64 DOWNSTREAM(FEET) = 1320.32  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 3826.73 CHANNEL SLOPE = 0.1582  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.90  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.549

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	434.11	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1991.20  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 20.65  
 AVERAGE FLOW DEPTH(FEET) = 4.88 TRAVEL TIME(MIN.) = 3.09  
 Tc(MIN.) = 41.22  
 SUBAREA AREA(ACRES) = 434.11 SUBAREA RUNOFF(CFS) = 487.84  
 EFFECTIVE AREA(ACRES) = 1897.56 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 1964.5 PEAK FLOW RATE(CFS) = 2134.73  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.05

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 5.05 FLOW VELOCITY(FEET/SEC.) = 21.01  
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10724.00 = 23207.33 FEET.

-----  
 END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 1964.5 TC(MIN.) = 41.22  
 EFFECTIVE AREA(ACRES) = 1897.56 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.995  
 PEAK FLOW RATE(CFS) = 2134.73

\*\* PEAK FLOW RATE TABLE \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	2134.73	41.22	1.549	0.30( 0.30)	1.00	1897.6	10710.00
2	2030.35	47.59	1.447	0.30( 0.30)	0.99	1964.5	10700.00

=====  
 END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

-----  
FILE NAME: S8.DAT  
TIME/DATE OF STUDY: 10:06 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.304
- 2) 10.00; 3.893
- 3) 15.00; 2.905
- 4) 20.00; 2.398
- 5) 25.00; 2.043
- 6) 30.00; 1.845
- 7) 40.00; 1.549
- 8) 50.00; 1.389
- 9) 60.00; 1.322
- 10) 90.00; 1.114
- 11) 120.00; 0.984
- 12) 180.00; 0.877
- 13) 360.00; 0.675
- 14) 1440.00; 0.304

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10800.00 TO NODE 10801.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 248.93  
ELEVATION DATA: UPSTREAM(FEET) = 2617.19 DOWNSTREAM(FEET) = 2506.15

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.540  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 5.079  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" - 0.83 0.30 1.000 0 7.54  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 3.57  
TOTAL AREA (ACRES) = 0.83 PEAK FLOW RATE (CFS) = 3.57

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10801.00 TO NODE 10802.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2506.15 DOWNSTREAM(FEET) = 2237.54  
CHANNEL LENGTH THRU SUBAREA(FEET) = 677.01 CHANNEL SLOPE = 0.3968  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.24  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 4.082  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN  
USER-DEFINED - 5.30 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.78  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.46  
AVERAGE FLOW DEPTH(FEET) = 0.22 TRAVEL TIME(MIN.) = 2.07  
Tc(MIN.) = 9.61  
SUBAREA AREA(ACRES) = 5.30 SUBAREA RUNOFF(CFS) = 18.04  
EFFECTIVE AREA(ACRES) = 6.13 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 6.1 PEAK FLOW RATE(CFS) = 20.87  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.29

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.29 FLOW VELOCITY(FEET/SEC.) = 6.69  
LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10802.00 = 925.94 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10802.00 TO NODE 10803.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2237.54 DOWNSTREAM(FEET) = 1920.11  
CHANNEL LENGTH THRU SUBAREA(FEET) = 954.74 CHANNEL SLOPE = 0.3325  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.54

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.600

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.25	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 48.05

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.48

AVERAGE FLOW DEPTH(FEET) = 0.51 TRAVEL TIME(MIN.) = 1.88

Tc(MIN.) = 11.48

SUBAREA AREA(ACRES) = 18.25 SUBAREA RUNOFF(CFS) = 54.20

EFFECTIVE AREA(ACRES) = 24.38 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 24.4 PEAK FLOW RATE(CFS) = 72.40

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.65

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.65 FLOW VELOCITY(FEET/SEC.) = 9.83

LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10803.00 = 1880.68 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10803.00 TO NODE 10820.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1920.11 DOWNSTREAM(FEET) = 1289.38  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2201.18 CHANNEL SLOPE = 0.2865  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.19

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.016

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	78.99	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 169.73

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.42

AVERAGE FLOW DEPTH(FEET) = 1.12 TRAVEL TIME(MIN.) = 2.95

Tc(MIN.) = 14.44

SUBAREA AREA(ACRES) = 78.99 SUBAREA RUNOFF(CFS) = 193.10

EFFECTIVE AREA(ACRES) = 103.37 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 103.4 PEAK FLOW RATE(CFS) = 252.70

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.40

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.40 FLOW VELOCITY(FEET/SEC.) = 14.11

LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10820.00 = 4081.86 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10803.00 TO NODE 10820.00 IS CODE = 10  
-----

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

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10640.00 TO NODE 10724.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: S6.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8028.60	19.03	0.30( 0.30)	1.00	3206.7	10630.00
2	8684.32	30.16	0.30( 0.30)	1.00	5092.6	10600.00
3	9031.66	36.93	0.30( 0.30)	1.00	6256.3	10500.00
4	9277.85	43.16	0.30( 0.30)	1.00	7254.0	10410.00
5	9287.45	54.20	0.30( 0.30)	1.00	8787.7	10400.00
6	9325.46	56.43	0.30( 0.30)	1.00	9057.4	10200.00
7	9281.30	62.03	0.30( 0.30)	1.00	9636.7	10300.00
8	9277.13	62.21	0.30( 0.30)	1.00	9649.4	10320.00
9	9093.16	66.64	0.30( 0.30)	1.00	9841.4	10210.00
10	8356.87	91.72	0.30( 0.30)	1.00	10538.0	10100.00

TOTAL AREA(ACRES) = 10538.0

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10723.00 TO NODE 10724.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 3 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: S7.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2134.73	41.22	0.30( 0.30)	1.00	1897.6	10710.00
2	2030.35	47.59	0.30( 0.30)	0.99	1964.5	10700.00

TOTAL AREA(ACRES) = 1964.5

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

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MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2134.73	41.22	0.30( 0.30)	1.00	1897.6	10710.00

2 2030.35 47.59 0.30( 0.30) 0.99 1964.5 10700.00  
TOTAL AREA(ACRES) = 1964.5

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

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2134.73	41.22	1.530	0.30( 0.30)	1.00	1897.6	10710.00
2	2030.35	47.59	1.428	0.30( 0.30)	0.99	1964.5	10700.00

LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10724.00 = 23207.33 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8028.60	19.03	2.496	0.30( 0.30)	1.00	3206.7	10630.00
2	8684.32	30.16	1.840	0.30( 0.30)	1.00	5092.6	10600.00
3	9031.66	36.93	1.640	0.30( 0.30)	1.00	6256.3	10500.00
4	9277.85	43.16	1.498	0.30( 0.30)	1.00	7254.0	10410.00
5	9287.45	54.20	1.361	0.30( 0.30)	1.00	8787.7	10400.00
6	9325.46	56.43	1.346	0.30( 0.30)	1.00	9057.4	10200.00
7	9281.30	62.03	1.308	0.30( 0.30)	1.00	9636.7	10300.00
8	9277.13	62.21	1.307	0.30( 0.30)	1.00	9649.4	10320.00
9	9093.16	66.64	1.276	0.30( 0.30)	1.00	9841.4	10210.00
10	8356.87	91.72	1.107	0.30( 0.30)	1.00	10538.0	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10724.00 = 45335.69 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9788.38	19.03	2.496	0.30( 0.30)	1.00	4082.9	10630.00
2	10640.79	30.16	1.840	0.30( 0.30)	1.00	6481.2	10600.00
3	11115.84	36.93	1.640	0.30( 0.30)	1.00	7956.6	10500.00
4	11335.67	41.22	1.530	0.30( 0.30)	1.00	8839.9	10710.00
5	11380.68	43.16	1.498	0.30( 0.30)	1.00	9172.0	10410.00
6	11312.04	47.59	1.428	0.30( 0.30)	1.00	9833.0	10700.00
7	11197.75	54.20	1.361	0.30( 0.30)	1.00	10752.1	10400.00
8	11208.85	56.43	1.346	0.30( 0.30)	1.00	11021.9	10200.00
9	11096.46	62.03	1.308	0.30( 0.30)	1.00	11601.2	10300.00
10	11090.05	62.21	1.307	0.30( 0.30)	1.00	11613.9	10320.00
11	10850.80	66.64	1.276	0.30( 0.30)	1.00	11805.8	10210.00
12	9810.01	91.72	1.107	0.30( 0.30)	1.00	12502.4	10100.00

TOTAL AREA(ACRES) = 12502.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 11380.68 Tc(MIN.) = 43.162  
EFFECTIVE AREA(ACRES) = 9172.03 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 12502.4  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10724.00 = 45335.69 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10724.00 TO NODE 10820.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
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ELEVATION DATA: UPSTREAM(FEET) = 1320.32 DOWNSTREAM(FEET) = 1289.38  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1341.06 CHANNEL SLOPE = 0.0231  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 12.01  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.474

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	47.66	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11405.85  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.39  
AVERAGE FLOW DEPTH(FEET) = 12.01 TRAVEL TIME(MIN.) = 1.55  
Tc(MIN.) = 44.72

SUBAREA AREA(ACRES) = 47.66 SUBAREA RUNOFF(CFS) = 50.34  
EFFECTIVE AREA(ACRES) = 9219.69 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 12550.1 PEAK FLOW RATE(CFS) = 11380.68  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.99

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 11.99 FLOW VELOCITY(FEET/SEC.) = 14.39  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10820.00 = 46676.75 FEET.

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

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9788.38	20.65	2.352	0.30( 0.30)	1.00	4130.5	10630.00
2	10640.79	31.74	1.793	0.30( 0.30)	1.00	6528.9	10600.00
3	11115.84	38.49	1.594	0.30( 0.30)	1.00	8004.2	10500.00
4	11335.67	42.77	1.505	0.30( 0.30)	1.00	8887.6	10710.00
5	11380.68	44.72	1.474	0.30( 0.30)	1.00	9219.7	10410.00
6	11312.04	49.14	1.403	0.30( 0.30)	1.00	9880.7	10700.00
7	11197.75	55.76	1.350	0.30( 0.30)	1.00	10799.8	10400.00
8	11208.85	57.99	1.335	0.30( 0.30)	1.00	11069.6	10200.00
9	11096.46	63.59	1.297	0.30( 0.30)	1.00	11648.9	10300.00
10	11090.05	63.77	1.296	0.30( 0.30)	1.00	11661.6	10320.00
11	10850.80	68.22	1.265	0.30( 0.30)	1.00	11853.5	10210.00
12	9810.01	93.33	1.100	0.30( 0.30)	1.00	12550.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10820.00 = 46676.75 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
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1 252.70 14.44 3.016 0.30( 0.30) 1.00 103.4 10800.00  
LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10820.00 = 4081.86 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9311.79	14.44	3.016	0.30( 0.30)	1.00	2991.8	10800.00
2	9979.30	20.65	2.352	0.30( 0.30)	1.00	4233.9	10630.00
3	10779.73	31.74	1.793	0.30( 0.30)	1.00	6632.3	10600.00
4	11236.20	38.49	1.594	0.30( 0.30)	1.00	8107.6	10500.00
5	11447.76	42.77	1.505	0.30( 0.30)	1.00	8991.0	10710.00
6	11489.86	44.72	1.474	0.30( 0.30)	1.00	9323.1	10410.00
7	11414.64	49.14	1.403	0.30( 0.30)	1.00	9984.1	10700.00
8	11295.47	55.76	1.350	0.30( 0.30)	1.00	10903.2	10400.00
9	11305.19	57.99	1.335	0.30( 0.30)	1.00	11173.0	10200.00
10	11189.23	63.59	1.297	0.30( 0.30)	1.00	11752.2	10300.00
11	11182.71	63.77	1.296	0.30( 0.30)	1.00	11765.0	10320.00
12	10940.58	68.22	1.265	0.30( 0.30)	1.00	11956.9	10210.00
13	9884.41	93.33	1.100	0.30( 0.30)	1.00	12653.5	10100.00
TOTAL AREA (ACRES) =		12653.5					

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 11489.86 Tc(MIN.) = 44.715  
EFFECTIVE AREA(ACRES) = 9323.06 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 12653.5  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10820.00 = 46676.75 FEET.

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FLOW PROCESS FROM NODE 10820.00 TO NODE 10840.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1289.38 DOWNSTREAM(FEET) = 1208.07  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2450.84 CHANNEL SLOPE = 0.0332  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.08  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.434  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 147.19 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11564.98  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.50  
AVERAGE FLOW DEPTH(FEET) = 11.08 TRAVEL TIME(MIN.) = 2.48  
Tc(MIN.) = 47.19  
SUBAREA AREA(ACRES) = 147.19 SUBAREA RUNOFF(CFS) = 150.22  
EFFECTIVE AREA(ACRES) = 9470.25 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 12800.7 PEAK FLOW RATE(CFS) = 11489.86  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.04

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 11.04 FLOW VELOCITY(FEET/SEC.) = 16.48

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10840.00 = 49127.59 FEET.

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FLOW PROCESS FROM NODE 10820.00 TO NODE 10840.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 47.19

RAINFALL INTENSITY(INCH/HR) = 1.43

AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA(ACRES) = 9470.25

TOTAL STREAM AREA(ACRES) = 12800.66

PEAK FLOW RATE(CFS) AT CONFLUENCE = 11489.86

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FLOW PROCESS FROM NODE 10830.00 TO NODE 10831.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 299.89

ELEVATION DATA: UPSTREAM(FEET) = 3249.56 DOWNSTREAM(FEET) = 3166.67

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

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.939

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 4.405

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER						
"CHAPARRAL,NARROWLEAF"	-	0.88	0.30	1.000	0	8.94
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30						
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000						
SUBAREA RUNOFF(CFS) = 3.25						
TOTAL AREA(ACRES) = 0.88 PEAK FLOW RATE(CFS) = 3.25						

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FLOW PROCESS FROM NODE 10831.00 TO NODE 10832.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3166.67 DOWNSTREAM(FEET) = 2954.84  
CHANNEL LENGTH THRU SUBAREA(FEET) = 677.65 CHANNEL SLOPE = 0.3126  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.19  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.566  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

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USER-DEFINED          -      2.82    0.30    1.000    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      7.43
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.16
AVERAGE FLOW DEPTH(FEET) = 0.17 TRAVEL TIME(MIN.) = 2.71
Tc(MIN.) = 11.65
SUBAREA AREA(ACRES) =      2.82      SUBAREA RUNOFF(CFS) =      8.29
EFFECTIVE AREA(ACRES) =      3.70      AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) =      3.7      PEAK FLOW RATE(CFS) =      10.88
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 0.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.22 FLOW VELOCITY(FEET/SEC.) = 4.82
LONGEST FLOWPATH FROM NODE 10830.00 TO NODE 10832.00 = 977.54 FEET.

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FLOW PROCESS FROM NODE 10832.00 TO NODE 10833.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2954.84 DOWNSTREAM(FEET) = 2765.08
CHANNEL LENGTH THRU SUBAREA(FEET) = 951.35 CHANNEL SLOPE = 0.1995
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 0.64
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.133
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS
LAND USE              GROUP  (ACRES)  (INCH/HR) (DECIMAL) CN
USER-DEFINED          -      29.25    0.30    1.000    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      48.38
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.23
AVERAGE FLOW DEPTH(FEET) = 0.60 TRAVEL TIME(MIN.) = 2.19
Tc(MIN.) = 13.85
SUBAREA AREA(ACRES) =      29.25      SUBAREA RUNOFF(CFS) =      74.58
EFFECTIVE AREA(ACRES) =      32.95      AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) =      33.0      PEAK FLOW RATE(CFS) =      84.01
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 0.83

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.83 FLOW VELOCITY(FEET/SEC.) = 8.72
LONGEST FLOWPATH FROM NODE 10830.00 TO NODE 10833.00 = 1928.89 FEET.

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FLOW PROCESS FROM NODE 10833.00 TO NODE 10834.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2765.08 DOWNSTREAM(FEET) = 2446.09
CHANNEL LENGTH THRU SUBAREA(FEET) = 1959.29 CHANNEL SLOPE = 0.1628
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.38
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.701
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS
LAND USE              GROUP  (ACRES)  (INCH/HR) (DECIMAL) CN
USER-DEFINED          -      80.66    0.30    1.000    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      171.45
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.30
AVERAGE FLOW DEPTH(FEET) = 1.32 TRAVEL TIME(MIN.) = 3.17
Tc(MIN.) = 17.02
SUBAREA AREA(ACRES) =      80.66      SUBAREA RUNOFF(CFS) =      174.27
EFFECTIVE AREA(ACRES) =      113.61      AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) =      113.6      PEAK FLOW RATE(CFS) =      245.46
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.61

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.61 FLOW VELOCITY(FEET/SEC.) = 11.51
LONGEST FLOWPATH FROM NODE 10830.00 TO NODE 10834.00 = 3888.18 FEET.

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FLOW PROCESS FROM NODE 10834.00 TO NODE 10835.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2446.09 DOWNSTREAM(FEET) = 1797.70
CHANNEL LENGTH THRU SUBAREA(FEET) = 2083.04 CHANNEL SLOPE = 0.3113
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.90
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.497
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS
LAND USE              GROUP  (ACRES)  (INCH/HR) (DECIMAL) CN
USER-DEFINED          -      196.68   0.30    1.000    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      440.06
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 17.26
AVERAGE FLOW DEPTH(FEET) = 1.86 TRAVEL TIME(MIN.) = 2.01
Tc(MIN.) = 19.03
SUBAREA AREA(ACRES) =      196.68      SUBAREA RUNOFF(CFS) =      388.84
EFFECTIVE AREA(ACRES) =      310.29      AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) =      310.3      PEAK FLOW RATE(CFS) =      613.44
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.23

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.23 FLOW VELOCITY(FEET/SEC.) = 19.02  
 LONGEST FLOWPATH FROM NODE 10830.00 TO NODE 10835.00 = 5971.22 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10835.00 TO NODE 10840.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1797.70 DOWNSTREAM(FEET) = 1208.07  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 3213.25 CHANNEL SLOPE = 0.1835  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.02  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.244

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	218.82	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 805.01  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 17.04  
 AVERAGE FLOW DEPTH(FEET) = 2.96 TRAVEL TIME(MIN.) = 3.14  
 Tc(MIN.) = 22.17  
 SUBAREA AREA(ACRES) = 218.82 SUBAREA RUNOFF(CFS) = 382.85  
 EFFECTIVE AREA(ACRES) = 529.11 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 529.11 PEAK FLOW RATE(CFS) = 925.74  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.19

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.19 FLOW VELOCITY(FEET/SEC.) = 17.70  
 LONGEST FLOWPATH FROM NODE 10830.00 TO NODE 10840.00 = 9184.47 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10835.00 TO NODE 10840.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 22.17  
 RAINFALL INTENSITY(INCH/HR) = 2.24  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 529.11  
 TOTAL STREAM AREA(ACRES) = 529.11  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 925.74

\*\* CONFLUENCE DATA \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
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NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE
1	9311.79	17.05	2.698	0.30( 0.30)	1.00	3139.0 10800.00
1	9979.30	23.21	2.170	0.30( 0.30)	1.00	4381.1 10630.00
1	10779.73	34.26	1.719	0.30( 0.30)	1.00	6779.5 10600.00
1	11236.20	40.98	1.533	0.30( 0.30)	1.00	8254.8 10500.00
1	11447.76	45.25	1.465	0.30( 0.30)	1.00	9138.1 10710.00
1	11489.86	47.19	1.434	0.30( 0.30)	1.00	9470.2 10410.00
1	11414.64	51.62	1.378	0.30( 0.30)	1.00	10131.2 10700.00
1	11295.47	58.25	1.334	0.30( 0.30)	1.00	11050.4 10400.00
1	11305.19	60.48	1.319	0.30( 0.30)	1.00	11320.1 10200.00
1	11189.23	66.08	1.280	0.30( 0.30)	1.00	11899.4 10300.00
1	11182.71	66.27	1.279	0.30( 0.30)	1.00	11912.1 10320.00
1	10940.58	70.72	1.248	0.30( 0.30)	1.00	12104.1 10210.00
1	9884.41	95.91	1.088	0.30( 0.30)	1.00	12800.7 10100.00
2	925.74	22.17	2.244	0.30( 0.30)	1.00	529.1 10830.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE	
1	10189.65	17.05	2.698	0.30( 0.30)	1.00	3545.9 10800.00	
2	10792.26	22.17	2.244	0.30( 0.30)	1.00	4700.4 10830.00	
3	10869.82	23.21	2.170	0.30( 0.30)	1.00	4910.2 10630.00	
4	11455.49	34.26	1.719	0.30( 0.30)	1.00	7308.6 10600.00	
5	11823.54	40.98	1.533	0.30( 0.30)	1.00	8783.9 10500.00	
6	12002.59	45.25	1.465	0.30( 0.30)	1.00	9667.3 10710.00	
7	12029.88	47.19	1.434	0.30( 0.30)	1.00	9999.4 10410.00	
8	11928.09	51.62	1.378	0.30( 0.30)	1.00	10660.4 10700.00	
9	11787.78	58.25	1.334	0.30( 0.30)	1.00	11579.5 10400.00	
10	11790.31	60.48	1.319	0.30( 0.30)	1.00	11849.3 10200.00	
11	11655.85	66.08	1.280	0.30( 0.30)	1.00	12428.5 10300.00	
12	11648.73	66.27	1.279	0.30( 0.30)	1.00	12441.3 10320.00	
13	11391.89	70.72	1.248	0.30( 0.30)	1.00	12633.2 10210.00	
14	10259.87	95.91	1.088	0.30( 0.30)	1.00	13329.8 10100.00	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 12029.88 Tc(MIN.) = 47.19  
 EFFECTIVE AREA(ACRES) = 9999.36 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 13329.8  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10840.00 = 49127.59 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10840.00 TO NODE 10841.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 1208.07 DOWNSTREAM(FEET) = 1119.03  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 3050.12 CHANNEL SLOPE = 0.0292  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 11.71  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.386

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL	AREA	Fp	Ap	SCS
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LAND USE      GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED -    222.84  0.30    1.000    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12138.84
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.95
AVERAGE FLOW DEPTH(FEET) = 11.69 TRAVEL TIME(MIN.) = 3.19
Tc(MIN.) = 50.38
SUBAREA AREA(ACRES) = 222.84 SUBAREA RUNOFF(CFS) = 217.91
EFFECTIVE AREA(ACRES) = 10222.20 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 13552.6 PEAK FLOW RATE(CFS) = 12029.88
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 11.64

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 11.64 FLOW VELOCITY(FEET/SEC.) = 15.92
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10841.00 = 52177.71 FEET.

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*****
FLOW PROCESS FROM NODE 10841.00 TO NODE 10860.00 IS CODE = 56

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 1119.03 DOWNSTREAM(FEET) = 1087.70
CHANNEL LENGTH THRU SUBAREA(FEET) = 1318.14 CHANNEL SLOPE = 0.0238
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 12.30
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.377
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL  AREA   Fp   Ap   SCS
LAND USE           GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED       -      265.26  0.30  1.000  -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12158.39
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.80
AVERAGE FLOW DEPTH(FEET) = 12.29 TRAVEL TIME(MIN.) = 1.48
Tc(MIN.) = 51.86
SUBAREA AREA(ACRES) = 265.26 SUBAREA RUNOFF(CFS) = 257.02
EFFECTIVE AREA(ACRES) = 10487.46 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 13817.9 PEAK FLOW RATE(CFS) = 12029.88
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 12.23

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 12.23 FLOW VELOCITY(FEET/SEC.) = 14.75
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10860.00 = 53495.85 FEET.

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*****
FLOW PROCESS FROM NODE 10841.00 TO NODE 10860.00 IS CODE = 1

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-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
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TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 51.86
RAINFALL INTENSITY(INCH/HR) = 1.38
AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 10487.46
TOTAL STREAM AREA(ACRES) = 13817.87
PEAK FLOW RATE(CFS) AT CONFLUENCE = 12029.88

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*****
FLOW PROCESS FROM NODE 10850.00 TO NODE 10851.00 IS CODE = 21

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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

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INITIAL SUBAREA FLOW-LENGTH(FEET) = 311.88
ELEVATION DATA: UPSTREAM(FEET) = 3029.66 DOWNSTREAM(FEET) = 2922.38

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Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.691
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 4.524
SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL  AREA   Fp   Ap   SCS  Tc
LAND USE           GROUP  (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" -      2.73  0.30  1.000  0  8.69
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 10.38
TOTAL AREA(ACRES) = 2.73 PEAK FLOW RATE(CFS) = 10.38

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*****
FLOW PROCESS FROM NODE 10851.00 TO NODE 10852.00 IS CODE = 56

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2922.38 DOWNSTREAM(FEET) = 2684.61
CHANNEL LENGTH THRU SUBAREA(FEET) = 687.05 CHANNEL SLOPE = 0.3461
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 0.30
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.778
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL  AREA   Fp   Ap   SCS
LAND USE           GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED       -      5.11  0.30  1.000  -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.41
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.06
AVERAGE FLOW DEPTH(FEET) = 0.29 TRAVEL TIME(MIN.) = 1.89
Tc(MIN.) = 10.58

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SUBAREA AREA (ACRES) = 5.11 SUBAREA RUNOFF (CFS) = 16.00  
EFFECTIVE AREA (ACRES) = 7.84 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 7.8 PEAK FLOW RATE (CFS) = 24.54  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.34

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.34 FLOW VELOCITY (FEET/SEC.) = 6.75  
LONGEST FLOWPATH FROM NODE 10850.00 TO NODE 10852.00 = 998.93 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10852.00 TO NODE 10853.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2684.61 DOWNSTREAM (FEET) = 2306.25  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1924.58 CHANNEL SLOPE = 0.1966  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.01  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 3.094

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	60.02	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 100.96  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.26  
AVERAGE FLOW DEPTH (FEET) = 0.92 TRAVEL TIME (MIN.) = 3.46  
Tc (MIN.) = 14.04

SUBAREA AREA (ACRES) = 60.02 SUBAREA RUNOFF (CFS) = 150.94  
EFFECTIVE AREA (ACRES) = 67.86 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 67.9 PEAK FLOW RATE (CFS) = 170.66  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.25

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.25 FLOW VELOCITY (FEET/SEC.) = 10.96  
LONGEST FLOWPATH FROM NODE 10850.00 TO NODE 10853.00 = 2923.51 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10853.00 TO NODE 10854.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2306.25 DOWNSTREAM (FEET) = 1555.12  
CHANNEL LENGTH THRU SUBAREA (FEET) = 3225.53 CHANNEL SLOPE = 0.2329  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.08  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.648

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	235.82	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 420.95  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 15.37  
AVERAGE FLOW DEPTH (FEET) = 1.97 TRAVEL TIME (MIN.) = 3.50  
Tc (MIN.) = 17.54

SUBAREA AREA (ACRES) = 235.82 SUBAREA RUNOFF (CFS) = 498.25  
EFFECTIVE AREA (ACRES) = 303.68 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 303.7 PEAK FLOW RATE (CFS) = 641.63  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.47

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 2.47 FLOW VELOCITY (FEET/SEC.) = 17.40  
LONGEST FLOWPATH FROM NODE 10850.00 TO NODE 10854.00 = 6149.04 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10854.00 TO NODE 10860.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1555.12 DOWNSTREAM (FEET) = 1087.70  
CHANNEL LENGTH THRU SUBAREA (FEET) = 3294.22 CHANNEL SLOPE = 0.1419  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.37  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.327

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	247.64	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 867.78  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 15.84  
AVERAGE FLOW DEPTH (FEET) = 3.30 TRAVEL TIME (MIN.) = 3.47  
Tc (MIN.) = 21.01

SUBAREA AREA (ACRES) = 247.64 SUBAREA RUNOFF (CFS) = 451.69  
EFFECTIVE AREA (ACRES) = 551.32 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 551.3 PEAK FLOW RATE (CFS) = 1005.60  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.56

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 3.56 FLOW VELOCITY (FEET/SEC.) = 16.50  
LONGEST FLOWPATH FROM NODE 10850.00 TO NODE 10860.00 = 9443.26 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10854.00 TO NODE 10860.00 IS CODE = 1

-----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<  
 -----

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 21.01  
 RAINFALL INTENSITY(INCH/HR) = 2.33  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 551.32  
 TOTAL STREAM AREA(ACRES) = 551.32  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 1005.60

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10189.65	21.91	2.262	0.30( 0.30)	1.00	4034.0	10800.00
1	10792.26	26.97	1.965	0.30( 0.30)	1.00	5188.5	10830.00
1	10869.82	28.00	1.924	0.30( 0.30)	1.00	5398.3	10630.00
1	11455.49	38.99	1.579	0.30( 0.30)	1.00	7796.7	10600.00
1	11823.54	45.67	1.458	0.30( 0.30)	1.00	9272.0	10500.00
1	12002.59	49.92	1.390	0.30( 0.30)	1.00	10155.4	10710.00
1	12029.88	51.86	1.377	0.30( 0.30)	1.00	10487.5	10410.00
1	11928.09	56.30	1.347	0.30( 0.30)	1.00	11148.5	10700.00
1	11787.78	62.94	1.302	0.30( 0.30)	1.00	12067.6	10400.00
1	11790.31	65.18	1.286	0.30( 0.30)	1.00	12337.4	10200.00
1	11655.85	70.79	1.247	0.30( 0.30)	1.00	12916.6	10300.00
1	11648.73	70.98	1.246	0.30( 0.30)	1.00	12929.4	10320.00
1	11391.89	75.46	1.215	0.30( 0.30)	1.00	13121.3	10210.00
1	10259.87	100.78	1.067	0.30( 0.30)	1.00	13817.9	10100.00
2	1005.60	21.01	2.327	0.30( 0.30)	1.00	551.3	10850.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11094.06	21.01	2.327	0.30( 0.30)	1.00	4418.4	10850.00
2	11163.33	21.91	2.262	0.30( 0.30)	1.00	4585.3	10800.00
3	11618.47	26.97	1.965	0.30( 0.30)	1.00	5739.8	10830.00
4	11675.74	28.00	1.924	0.30( 0.30)	1.00	5949.6	10630.00
5	12090.17	38.99	1.579	0.30( 0.30)	1.00	8348.0	10600.00
6	12398.29	45.67	1.458	0.30( 0.30)	1.00	9823.3	10500.00
7	12543.59	49.92	1.390	0.30( 0.30)	1.00	10706.7	10710.00
8	12564.08	51.86	1.377	0.30( 0.30)	1.00	11038.8	10410.00
9	12447.52	56.30	1.347	0.30( 0.30)	1.00	11699.8	10700.00
10	12284.79	62.94	1.302	0.30( 0.30)	1.00	12618.9	10400.00
11	12279.64	65.18	1.286	0.30( 0.30)	1.00	12888.7	10200.00
12	12125.85	70.79	1.247	0.30( 0.30)	1.00	13468.0	10300.00
13	12118.10	70.98	1.246	0.30( 0.30)	1.00	13480.7	10320.00
14	11845.83	75.46	1.215	0.30( 0.30)	1.00	13672.6	10210.00
15	10640.62	100.78	1.067	0.30( 0.30)	1.00	14369.2	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 12564.08 Tc(MIN.) = 51.86

EFFECTIVE AREA(ACRES) = 11038.78 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 14369.2  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10860.00 = 53495.85 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10860.00 TO NODE 10921.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<  
 -----

ELEVATION DATA: UPSTREAM(FEET) = 1087.70 DOWNSTREAM(FEET) = 961.06  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 4791.22 CHANNEL SLOPE = 0.0264  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 12.27  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.342  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCSSOIL AREA Fp Ap SCSS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 402.51 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12752.87  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.58  
 AVERAGE FLOW DEPTH(FEET) = 12.26 TRAVEL TIME(MIN.) = 5.12  
 Tc(MIN.) = 56.99  
 SUBAREA AREA(ACRES) = 402.51 SUBAREA RUNOFF(CFS) = 377.57  
 EFFECTIVE AREA(ACRES) = 11441.29 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 14771.7 PEAK FLOW RATE(CFS) = 12564.08  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 12.17

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 12.17 FLOW VELOCITY(FEET/SEC.) = 15.52  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10921.00 = 58287.07 FEET.  
 -----

END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 14771.7 TC(MIN.) = 56.99  
 EFFECTIVE AREA(ACRES) = 11441.29 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.998  
 PEAK FLOW RATE(CFS) = 12564.08

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11094.06	26.28	1.992	0.30( 0.30)	1.00	4820.9	10850.00
2	11163.33	27.18	1.957	0.30( 0.30)	1.00	4987.8	10800.00
3	11618.47	32.19	1.780	0.30( 0.30)	1.00	6142.3	10830.00
4	11675.74	33.21	1.750	0.30( 0.30)	1.00	6352.1	10630.00
5	12090.17	44.16	1.482	0.30( 0.30)	1.00	8750.5	10600.00
6	12398.29	50.81	1.384	0.30( 0.30)	1.00	10225.8	10500.00
7	12543.59	55.05	1.355	0.30( 0.30)	1.00	11109.2	10710.00
8	12564.08	56.99	1.342	0.30( 0.30)	1.00	11441.3	10410.00
9	12447.52	61.44	1.312	0.30( 0.30)	1.00	12102.3	10700.00

10	12284.79	68.10	1.266	0.30 ( 0.30)	1.00	13021.4	10400.00
11	12279.64	70.33	1.250	0.30 ( 0.30)	1.00	13291.2	10200.00
12	12125.85	75.97	1.211	0.30 ( 0.30)	1.00	13870.5	10300.00
13	12118.10	76.15	1.210	0.30 ( 0.30)	1.00	13883.2	10320.00
14	11845.83	80.67	1.179	0.30 ( 0.30)	1.00	14075.1	10210.00
15	10640.62	106.14	1.044	0.30 ( 0.30)	1.00	14771.7	10100.00

=====  
=====  
END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

-----  
FILE NAME: S9.DAT  
TIME/DATE OF STUDY: 10:06 04/01/2013  
=====

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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

---\*TIME-OF-CONCENTRATION MODEL\*---

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.304
- 2) 10.00; 3.893
- 3) 15.00; 2.905
- 4) 20.00; 2.398
- 5) 25.00; 2.043
- 6) 30.00; 1.845
- 7) 40.00; 1.549
- 8) 50.00; 1.389
- 9) 60.00; 1.322
- 10) 90.00; 1.114
- 11) 120.00; 0.984
- 12) 180.00; 0.877
- 13) 360.00; 0.675
- 14) 1440.00; 0.304

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10900.00 TO NODE 10901.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 305.17  
ELEVATION DATA: UPSTREAM(FEET) = 3291.76 DOWNSTREAM(FEET) = 3104.08

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.671  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 5.016

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	1.19	0.30	1.000	0	7.67

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

SUBAREA RUNOFF(CFS) = 5.05

TOTAL AREA(ACRES) = 1.19 PEAK FLOW RATE(CFS) = 5.05

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10901.00 TO NODE 10902.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3104.08 DOWNSTREAM(FEET) = 2877.50  
CHANNEL LENGTH THRU SUBAREA(FEET) = 666.71 CHANNEL SLOPE = 0.3398  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.20

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.887

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	2.53	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.18

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.71

AVERAGE FLOW DEPTH(FEET) = 0.19 TRAVEL TIME(MIN.) = 2.36

Tc(MIN.) = 10.03

SUBAREA AREA(ACRES) = 2.53 SUBAREA RUNOFF(CFS) = 8.17

EFFECTIVE AREA(ACRES) = 3.72 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 3.7 PEAK FLOW RATE(CFS) = 12.01

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.22 FLOW VELOCITY(FEET/SEC.) = 5.13

LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10902.00 = 971.88 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10902.00 TO NODE 10903.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2877.50 DOWNSTREAM(FEET) = 2643.95  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1916.39 CHANNEL SLOPE = 0.1219  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.86

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.913

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	36.43	0.30	1.000	-

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 56.11

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.48

AVERAGE FLOW DEPTH(FEET) = 0.75 TRAVEL TIME(MIN.) = 4.93

Tc(MIN.) = 14.96

SUBAREA AREA(ACRES) = 36.43 SUBAREA RUNOFF(CFS) = 85.69

EFFECTIVE AREA(ACRES) = 40.15 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 40.2 PEAK FLOW RATE(CFS) = 94.43

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.02

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.02 FLOW VELOCITY(FEET/SEC.) = 7.71

LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10903.00 = 2888.27 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10903.00 TO NODE 10904.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2643.95 DOWNSTREAM(FEET) = 2373.49  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1931.90 CHANNEL SLOPE = 0.1400  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.68

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.604

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	129.07	0.30	1.000	-

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 228.66

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.71

AVERAGE FLOW DEPTH(FEET) = 1.61 TRAVEL TIME(MIN.) = 3.01

Tc(MIN.) = 17.97

SUBAREA AREA(ACRES) = 129.07 SUBAREA RUNOFF(CFS) = 267.68

EFFECTIVE AREA(ACRES) = 169.22 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 169.2 PEAK FLOW RATE(CFS) = 350.95

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.05

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.05 FLOW VELOCITY(FEET/SEC.) = 12.16

LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10904.00 = 4820.17 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10904.00 TO NODE 10905.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2373.49 DOWNSTREAM(FEET) = 1817.76  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2764.66 CHANNEL SLOPE = 0.2010  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.18

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.323

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	117.70	0.30	1.000	-

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 458.26

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.93

AVERAGE FLOW DEPTH(FEET) = 2.15 TRAVEL TIME(MIN.) = 3.09

Tc(MIN.) = 21.05

SUBAREA AREA(ACRES) = 117.70 SUBAREA RUNOFF(CFS) = 214.35

EFFECTIVE AREA(ACRES) = 286.92 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 286.9 PEAK FLOW RATE(CFS) = 522.51

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.30

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.30 FLOW VELOCITY(FEET/SEC.) = 15.55

LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10905.00 = 7584.83 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10905.00 TO NODE 10906.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1817.76 DOWNSTREAM(FEET) = 1387.73  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2799.36 CHANNEL SLOPE = 0.1536  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.21

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.117

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	363.93	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 820.45  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.05  
 AVERAGE FLOW DEPTH(FEET) = 3.14 TRAVEL TIME(MIN.) = 2.91  
 Tc(MIN.) = 23.96  
 SUBAREA AREA(ACRES) = 363.93 SUBAREA RUNOFF(CFS) = 595.14  
 EFFECTIVE AREA(ACRES) = 650.85 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 650.8 PEAK FLOW RATE(CFS) = 1064.35  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.59

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.59 FLOW VELOCITY(FEET/SEC.) = 17.25  
 LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10906.00 = 10384.19 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10906.00 TO NODE 10920.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1387.73 DOWNSTREAM(FEET) = 1113.60  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2484.63 CHANNEL SLOPE = 0.1103  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.99  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.978

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	56.85	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1107.28  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.45  
 AVERAGE FLOW DEPTH(FEET) = 3.99 TRAVEL TIME(MIN.) = 2.68  
 Tc(MIN.) = 26.64  
 SUBAREA AREA(ACRES) = 56.85 SUBAREA RUNOFF(CFS) = 85.86  
 EFFECTIVE AREA(ACRES) = 707.70 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 707.7 PEAK FLOW RATE(CFS) = 1068.88  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.92

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.92 FLOW VELOCITY(FEET/SEC.) = 15.30  
 LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10920.00 = 12868.82 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10906.00 TO NODE 10920.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 26.64  
 RAINFALL INTENSITY(INCH/HR) = 1.98  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 707.70  
 TOTAL STREAM AREA(ACRES) = 707.70  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 1068.88

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

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 287.29  
 ELEVATION DATA: UPSTREAM(FEET) = 3119.43 DOWNSTREAM(FEET) = 3044.59

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.891  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 4.428  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	1.91	0.30	1.000	0	8.89

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 7.10  
 TOTAL AREA(ACRES) = 1.91 PEAK FLOW RATE(CFS) = 7.10

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10911.00 TO NODE 10912.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3044.59 DOWNSTREAM(FEET) = 2980.93  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 627.50 CHANNEL SLOPE = 0.1015  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.36  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.547

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	4.16	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 13.21  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.66  
 AVERAGE FLOW DEPTH(FEET) = 0.34 TRAVEL TIME(MIN.) = 2.86  
 Tc(MIN.) = 11.75  
 SUBAREA AREA(ACRES) = 4.16 SUBAREA RUNOFF(CFS) = 12.16  
 EFFECTIVE AREA(ACRES) = 6.07 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 6.1 PEAK FLOW RATE(CFS) = 17.74

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.40

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.40 FLOW VELOCITY (FEET/SEC.) = 4.09  
LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10912.00 = 914.79 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10912.00 TO NODE 10913.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2980.93 DOWNSTREAM (FEET) = 2876.01  
CHANNEL LENGTH THRU SUBAREA (FEET) = 984.99 CHANNEL SLOPE = 0.1065  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.74  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.987

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	22.86	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 45.57  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.79  
AVERAGE FLOW DEPTH (FEET) = 0.69 TRAVEL TIME (MIN.) = 2.84  
Tc (MIN.) = 14.59  
SUBAREA AREA (ACRES) = 22.86 SUBAREA RUNOFF (CFS) = 55.27  
EFFECTIVE AREA (ACRES) = 28.93 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 28.9 PEAK FLOW RATE (CFS) = 69.95  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.89

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.89 FLOW VELOCITY (FEET/SEC.) = 6.67  
LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10913.00 = 1899.78 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10913.00 TO NODE 10914.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2876.01 DOWNSTREAM (FEET) = 2832.29  
CHANNEL LENGTH THRU SUBAREA (FEET) = 939.99 CHANNEL SLOPE = 0.0465  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.63  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.686

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	53.02	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 126.99  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.10  
AVERAGE FLOW DEPTH (FEET) = 1.58 TRAVEL TIME (MIN.) = 2.57  
Tc (MIN.) = 17.16

SUBAREA AREA (ACRES) = 53.02 SUBAREA RUNOFF (CFS) = 113.87  
EFFECTIVE AREA (ACRES) = 81.95 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 81.9 PEAK FLOW RATE (CFS) = 176.01  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.89

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.89 FLOW VELOCITY (FEET/SEC.) = 6.74  
LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10914.00 = 2839.77 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10914.00 TO NODE 10915.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2832.29 DOWNSTREAM (FEET) = 2769.58  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1006.52 CHANNEL SLOPE = 0.0623  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.22  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.484

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	90.80	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 265.34  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.41  
AVERAGE FLOW DEPTH (FEET) = 2.19 TRAVEL TIME (MIN.) = 1.99  
Tc (MIN.) = 19.15  
SUBAREA AREA (ACRES) = 90.80 SUBAREA RUNOFF (CFS) = 178.49  
EFFECTIVE AREA (ACRES) = 172.75 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 172.8 PEAK FLOW RATE (CFS) = 339.58  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.50

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 2.50 FLOW VELOCITY (FEET/SEC.) = 9.06  
LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10915.00 = 3846.29 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10915.00 TO NODE 10916.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2769.58 DOWNSTREAM(FEET) = 2453.21  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 3003.36 CHANNEL SLOPE = 0.1053  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.06  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.182  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 311.96 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 604.55  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.86  
 AVERAGE FLOW DEPTH(FEET) = 2.96 TRAVEL TIME(MIN.) = 3.89  
 Tc(MIN.) = 23.04  
 SUBAREA AREA(ACRES) = 311.96 SUBAREA RUNOFF(CFS) = 528.37  
 EFFECTIVE AREA(ACRES) = 484.71 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 484.7 PEAK FLOW RATE(CFS) = 820.96  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.46  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.46 FLOW VELOCITY(FEET/SEC.) = 14.02  
 LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10916.00 = 6849.65 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10916.00 TO NODE 10917.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 2453.21 DOWNSTREAM(FEET) = 1787.18  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2846.14 CHANNEL SLOPE = 0.2340  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.16  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.025  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 238.62 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1006.30  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 19.76  
 AVERAGE FLOW DEPTH(FEET) = 3.13 TRAVEL TIME(MIN.) = 2.40  
 Tc(MIN.) = 25.44  
 SUBAREA AREA(ACRES) = 238.62 SUBAREA RUNOFF(CFS) = 370.56  
 EFFECTIVE AREA(ACRES) = 723.33 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 723.3 PEAK FLOW RATE(CFS) = 1123.27  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.31

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.31 FLOW VELOCITY(FEET/SEC.) = 20.38  
 LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10917.00 = 9695.79 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10917.00 TO NODE 10918.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 1787.18 DOWNSTREAM(FEET) = 1279.22  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2918.23 CHANNEL SLOPE = 0.1741  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.76  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.923  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 150.63 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1233.29  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 18.79  
 AVERAGE FLOW DEPTH(FEET) = 3.75 TRAVEL TIME(MIN.) = 2.59  
 Tc(MIN.) = 28.03  
 SUBAREA AREA(ACRES) = 150.63 SUBAREA RUNOFF(CFS) = 220.02  
 EFFECTIVE AREA(ACRES) = 873.96 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 874.0 PEAK FLOW RATE(CFS) = 1276.55  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.82

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.82 FLOW VELOCITY(FEET/SEC.) = 18.96  
 LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10918.00 = 12614.02 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10918.00 TO NODE 10920.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 1279.22 DOWNSTREAM(FEET) = 1113.60  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1664.50 CHANNEL SLOPE = 0.0995  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.47  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.852  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 60.16 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1318.58  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.59



AVERAGE FLOW DEPTH(FEET) = 4.47 TRAVEL TIME(MIN.) = 1.78  
 Tc(MIN.) = 29.81  
 SUBAREA AREA(ACRES) = 60.16 SUBAREA RUNOFF(CFS) = 84.06  
 EFFECTIVE AREA(ACRES) = 934.12 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 934.1 PEAK FLOW RATE(CFS) = 1305.20  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.44

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.44 FLOW VELOCITY(FEET/SEC.) = 15.55  
 LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10920.00 = 14278.52 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10918.00 TO NODE 10920.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====  
 TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 29.81  
 RAINFALL INTENSITY(INCH/HR) = 1.85  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 934.12  
 TOTAL STREAM AREA(ACRES) = 934.12  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 1305.20

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1068.88	26.64	1.978	0.30( 0.30)	1.00	707.7	10900.00
2	1305.20	29.81	1.852	0.30( 0.30)	1.00	934.1	10910.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2329.55	26.64	1.978	0.30( 0.30)	1.00	1542.4	10900.00
2	2294.04	29.81	1.852	0.30( 0.30)	1.00	1641.8	10910.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 2329.55 Tc(MIN.) = 26.64  
 EFFECTIVE AREA(ACRES) = 1542.38 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 1641.8  
 LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10920.00 = 14278.52 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10920.00 TO NODE 10921.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====  
 ELEVATION DATA: UPSTREAM(FEET) = 1113.60 DOWNSTREAM(FEET) = 961.06  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2282.16 CHANNEL SLOPE = 0.0668  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 6.67  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.883  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCSSOIL AREA Fp Ap SCSS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 185.67 0.30 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2461.84  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.87  
 AVERAGE FLOW DEPTH(FEET) = 6.66 TRAVEL TIME(MIN.) = 2.40  
 Tc(MIN.) = 29.04  
 SUBAREA AREA(ACRES) = 185.67 SUBAREA RUNOFF(CFS) = 264.57  
 EFFECTIVE AREA(ACRES) = 1728.05 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 1827.5 PEAK FLOW RATE(CFS) = 2462.34  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 6.66

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 6.66 FLOW VELOCITY(FEET/SEC.) = 15.87  
 LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10921.00 = 16560.68 FEET.

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1827.5 TC(MIN.) = 29.04  
 EFFECTIVE AREA(ACRES) = 1728.05 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.000  
 PEAK FLOW RATE(CFS) = 2462.34

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2462.34	29.04	1.883	0.30( 0.30)	1.00	1728.1	10900.00
2	2433.20	32.22	1.779	0.30( 0.30)	1.00	1827.5	10910.00

=====  
 END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

-----  
FILE NAME: S10.DAT  
TIME/DATE OF STUDY: 10:06 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.148
- 2) 10.00; 3.819
- 3) 15.00; 2.862
- 4) 20.00; 2.367
- 5) 25.00; 2.022
- 6) 30.00; 1.825
- 7) 40.00; 1.534
- 8) 50.00; 1.374
- 9) 60.00; 1.300
- 10) 90.00; 1.093
- 11) 120.00; 0.963
- 12) 180.00; 0.853
- 13) 360.00; 0.653
- 14) 1440.00; 0.293

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11000.00 TO NODE 11001.00 IS CODE = 21  
-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 362.38  
ELEVATION DATA: UPSTREAM(FEET) = 2528.19 DOWNSTREAM(FEET) = 2375.55

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.863  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 4.349  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)  
NATURAL FAIR COVER  
"OPEN BRUSH" - 2.03 0.30 1.000 0 8.86  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 7.40  
TOTAL AREA(ACRES) = 2.03 PEAK FLOW RATE(CFS) = 7.40

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11001.00 TO NODE 11002.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2375.55 DOWNSTREAM(FEET) = 2005.09  
CHANNEL LENGTH THRU SUBAREA(FEET) = 575.45 CHANNEL SLOPE = 0.6438  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.20  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.745  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN  
USER-DEFINED - 3.14 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.28  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.30  
AVERAGE FLOW DEPTH(FEET) = 0.19 TRAVEL TIME(MIN.) = 1.52  
Tc(MIN.) = 10.39  
SUBAREA AREA(ACRES) = 3.14 SUBAREA RUNOFF(CFS) = 9.74  
EFFECTIVE AREA(ACRES) = 5.17 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 5.2 PEAK FLOW RATE(CFS) = 16.03  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.22 FLOW VELOCITY(FEET/SEC.) = 7.03  
LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11002.00 = 937.83 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11002.00 TO NODE 11003.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2005.09 DOWNSTREAM(FEET) = 1450.44  
CHANNEL LENGTH THRU SUBAREA(FEET) = 962.43 CHANNEL SLOPE = 0.5763  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.40

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.420

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	16.53	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 39.29

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.44

AVERAGE FLOW DEPTH(FEET) = 0.39 TRAVEL TIME(MIN.) = 1.70

Tc(MIN.) = 12.08

SUBAREA AREA(ACRES) = 16.53 SUBAREA RUNOFF(CFS) = 46.42

EFFECTIVE AREA(ACRES) = 21.70 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 21.7 PEAK FLOW RATE(CFS) = 60.94

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.50

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.50 FLOW VELOCITY(FEET/SEC.) = 11.06

LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11003.00 = 1900.26 FEET.

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\*\*\*\*\*  
FLOW PROCESS FROM NODE 11003.00 TO NODE 11020.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1450.44 DOWNSTREAM(FEET) = 939.63  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1351.71 CHANNEL SLOPE = 0.3779  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.78

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.044

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	30.99	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 99.29

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.47

AVERAGE FLOW DEPTH(FEET) = 0.75 TRAVEL TIME(MIN.) = 1.96

Tc(MIN.) = 14.05

SUBAREA AREA(ACRES) = 30.99 SUBAREA RUNOFF(CFS) = 76.54

EFFECTIVE AREA(ACRES) = 52.69 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 52.7 PEAK FLOW RATE(CFS) = 130.13

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.88

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.88 FLOW VELOCITY(FEET/SEC.) = 12.54

LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11020.00 = 3251.97 FEET.

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\*\*\*\*\*  
FLOW PROCESS FROM NODE 11003.00 TO NODE 11020.00 IS CODE = 10  
-----

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

-----  
\*\*\*\*\*  
FLOW PROCESS FROM NODE 10860.00 TO NODE 10921.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<

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PEAK FLOWRATE TABLE FILE NAME: S8.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11094.06	26.28	0.30( 0.30)	1.00	4820.9	10850.00
2	11163.33	27.18	0.30( 0.30)	1.00	4987.8	10800.00
3	11618.47	32.19	0.30( 0.30)	1.00	6142.3	10830.00
4	11675.74	33.21	0.30( 0.30)	1.00	6352.1	10630.00
5	12090.17	44.16	0.30( 0.30)	1.00	8750.5	10600.00
6	12398.29	50.81	0.30( 0.30)	1.00	10225.8	10500.00
7	12543.59	55.05	0.30( 0.30)	1.00	11109.2	10710.00
8	12564.08	56.99	0.30( 0.30)	1.00	11441.3	10410.00
9	12447.52	61.44	0.30( 0.30)	1.00	12102.3	10700.00
10	12284.79	68.10	0.30( 0.30)	1.00	13021.4	10400.00
11	12279.64	70.33	0.30( 0.30)	1.00	13291.2	10200.00
12	12125.85	75.97	0.30( 0.30)	1.00	13870.5	10300.00
13	12118.10	76.15	0.30( 0.30)	1.00	13883.2	10320.00
14	11845.83	80.67	0.30( 0.30)	1.00	14075.1	10210.00
15	10640.62	106.14	0.30( 0.30)	1.00	14771.7	10100.00

TOTAL AREA(ACRES) = 14771.7

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\*\*\*\*\*  
FLOW PROCESS FROM NODE 10920.00 TO NODE 10921.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 3 <<<<

=====

PEAK FLOWRATE TABLE FILE NAME: S9.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2462.34	29.04	0.30( 0.30)	1.00	1728.1	10900.00
2	2433.20	32.22	0.30( 0.30)	1.00	1827.5	10910.00

TOTAL AREA(ACRES) = 1827.5

-----  
\*\*\*\*\*  
FLOW PROCESS FROM NODE 10920.00 TO NODE 10921.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2462.34	29.04	0.30( 0.30)	1.00	1728.1	10900.00
2	2433.20	32.22	0.30( 0.30)	1.00	1827.5	10910.00
TOTAL AREA (ACRES) =						1827.5

\*\*\*\*\*

FLOW PROCESS FROM NODE 10860.00 TO NODE 10921.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2462.34	29.04	1.863	0.30( 0.30)	1.00	1728.1	10900.00
2	2433.20	32.22	1.760	0.30( 0.30)	1.00	1827.5	10910.00
LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10921.00 = 16560.68 FEET.							

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11094.06	26.28	1.971	0.30( 0.30)	1.00	4820.9	10850.00
2	11163.33	27.18	1.936	0.30( 0.30)	1.00	4987.8	10800.00
3	11618.47	32.19	1.761	0.30( 0.30)	1.00	6142.3	10830.00
4	11675.74	33.21	1.731	0.30( 0.30)	1.00	6352.1	10630.00
5	12090.17	44.16	1.467	0.30( 0.30)	1.00	8750.5	10600.00
6	12398.29	50.81	1.368	0.30( 0.30)	1.00	10225.8	10500.00
7	12543.59	55.05	1.337	0.30( 0.30)	1.00	11109.2	10710.00
8	12564.08	56.99	1.322	0.30( 0.30)	1.00	11441.3	10410.00
9	12447.52	61.44	1.290	0.30( 0.30)	1.00	12102.3	10700.00
10	12284.79	68.10	1.244	0.30( 0.30)	1.00	13021.4	10400.00
11	12279.64	70.33	1.229	0.30( 0.30)	1.00	13291.2	10200.00
12	12125.85	75.97	1.190	0.30( 0.30)	1.00	13870.5	10300.00
13	12118.10	76.15	1.189	0.30( 0.30)	1.00	13883.2	10320.00
14	11845.83	80.67	1.157	0.30( 0.30)	1.00	14075.1	10210.00
15	10640.62	106.14	1.023	0.30( 0.30)	1.00	14771.7	10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10921.00 = 58287.07 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13477.61	26.28	1.971	0.30( 0.30)	1.00	6385.1	10850.00
2	13576.15	27.18	1.936	0.30( 0.30)	1.00	6605.5	10800.00
3	13794.24	29.04	1.863	0.30( 0.30)	1.00	7143.4	10900.00
4	14051.95	32.19	1.761	0.30( 0.30)	1.00	7968.8	10830.00
5	14053.36	32.22	1.760	0.30( 0.30)	1.00	7976.0	10910.00
6	14060.69	33.21	1.731	0.30( 0.30)	1.00	8179.6	10630.00
7	14035.31	44.16	1.467	0.30( 0.30)	1.00	10578.0	10600.00
8	14177.66	50.81	1.368	0.30( 0.30)	1.00	12053.3	10500.00
9	14270.76	55.05	1.337	0.30( 0.30)	1.00	12936.7	10710.00
10	14267.35	56.99	1.322	0.30( 0.30)	1.00	13268.8	10410.00
11	14097.08	61.44	1.290	0.30( 0.30)	1.00	13929.8	10700.00
12	13857.82	68.10	1.244	0.30( 0.30)	1.00	14848.9	10400.00
13	13826.98	70.33	1.229	0.30( 0.30)	1.00	15118.7	10200.00
14	13608.40	75.97	1.190	0.30( 0.30)	1.00	15698.0	10300.00

15	13598.53	76.15	1.189	0.30( 0.30)	1.00	15710.7	10320.00
16	13274.32	80.67	1.157	0.30( 0.30)	1.00	15902.6	10210.00
17	11845.35	106.14	1.023	0.30( 0.30)	1.00	16599.2	10100.00
TOTAL AREA (ACRES) =						16599.2	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 14270.76 Tc(MIN.) = 55.049  
 EFFECTIVE AREA(ACRES) = 12936.67 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 16599.2  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10921.00 = 58287.07 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10921.00 TO NODE 11020.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 961.06 DOWNSTREAM(FEET) = 939.63  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 601.65 CHANNEL SLOPE = 0.0356  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 11.04  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.333  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCSSOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 18.29 0.30 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14279.26  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 20.48  
 AVERAGE FLOW DEPTH(FEET) = 11.04 TRAVEL TIME(MIN.) = 0.49  
 Tc(MIN.) = 55.54  
 SUBAREA AREA(ACRES) = 18.29 SUBAREA RUNOFF(CFS) = 17.01  
 EFFECTIVE AREA(ACRES) = 12954.96 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 16617.5 PEAK FLOW RATE(CFS) = 14270.76  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 11.04

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 11.04 FLOW VELOCITY(FEET/SEC.) = 20.49  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11020.00 = 58888.71 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11003.00 TO NODE 11020.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13477.61	26.78	1.952	0.30( 0.30)	1.00	6403.4	10850.00
2	13576.15	27.68	1.917	0.30( 0.30)	1.00	6623.7	10800.00

Node	Elevation (FEET)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
3	13794.24	29.53	1.844	0.30 ( 0.30)	1.00	7161.7	10900.00
4	14051.95	32.68	1.747	0.30 ( 0.30)	1.00	7987.1	10830.00
5	14053.36	32.71	1.746	0.30 ( 0.30)	1.00	7994.3	10910.00
6	14060.69	33.71	1.717	0.30 ( 0.30)	1.00	8197.9	10630.00
7	14035.31	44.65	1.460	0.30 ( 0.30)	1.00	10596.3	10600.00
8	14177.66	51.30	1.364	0.30 ( 0.30)	1.00	12071.6	10500.00
9	14270.76	55.54	1.333	0.30 ( 0.30)	1.00	12955.0	10710.00
10	14267.35	57.48	1.319	0.30 ( 0.30)	1.00	13287.1	10410.00
11	14097.08	61.93	1.287	0.30 ( 0.30)	1.00	13948.1	10700.00
12	13857.82	68.59	1.241	0.30 ( 0.30)	1.00	14867.2	10400.00
13	13826.98	70.83	1.225	0.30 ( 0.30)	1.00	15137.0	10200.00
14	13608.40	76.47	1.186	0.30 ( 0.30)	1.00	15716.2	10300.00
15	13598.53	76.65	1.185	0.30 ( 0.30)	1.00	15729.0	10320.00
16	13274.32	81.17	1.154	0.30 ( 0.30)	1.00	15920.9	10210.00
17	11845.35	106.66	1.021	0.30 ( 0.30)	1.00	16617.5	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11020.00 = 58888.71 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	130.13	14.05	3.044	0.30 ( 0.30)	1.00	52.7	11000.00

LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11020.00 = 3251.97 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11874.63	14.05	3.044	0.30 ( 0.30)	1.00	3412.0	11000.00
2	13555.94	26.78	1.952	0.30 ( 0.30)	1.00	6456.1	10850.00
3	13652.81	27.68	1.917	0.30 ( 0.30)	1.00	6676.4	10800.00
4	13867.44	29.53	1.844	0.30 ( 0.30)	1.00	7214.4	10900.00
5	14120.57	32.68	1.747	0.30 ( 0.30)	1.00	8039.8	10830.00
6	14121.94	32.71	1.746	0.30 ( 0.30)	1.00	8046.9	10910.00
7	14127.90	33.71	1.717	0.30 ( 0.30)	1.00	8250.6	10630.00
8	14090.30	44.65	1.460	0.30 ( 0.30)	1.00	10649.0	10600.00
9	14228.13	51.30	1.364	0.30 ( 0.30)	1.00	12124.3	10500.00
10	14319.75	55.54	1.333	0.30 ( 0.30)	1.00	13007.7	10710.00
11	14315.66	57.48	1.319	0.30 ( 0.30)	1.00	13339.8	10410.00
12	14143.87	61.93	1.287	0.30 ( 0.30)	1.00	14000.8	10700.00
13	13902.44	68.59	1.241	0.30 ( 0.30)	1.00	14919.9	10400.00
14	13870.86	70.83	1.225	0.30 ( 0.30)	1.00	15189.7	10200.00
15	13650.44	76.47	1.186	0.30 ( 0.30)	1.00	15768.9	10300.00
16	13640.51	76.65	1.185	0.30 ( 0.30)	1.00	15781.7	10320.00
17	13314.82	81.17	1.154	0.30 ( 0.30)	1.00	15973.6	10210.00
18	11879.54	106.66	1.021	0.30 ( 0.30)	1.00	16670.2	10100.00

TOTAL AREA (ACRES) = 16670.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 14319.75 Tc (MIN.) = 55.538  
EFFECTIVE AREA (ACRES) = 13007.65 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 16670.2  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11020.00 = 58888.71 FEET.

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FLOW PROCESS FROM NODE 11020.00 TO NODE 11021.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 939.63 DOWNSTREAM (FEET) = 865.22  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2876.19 CHANNEL SLOPE = 0.0259  
GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 11.98  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.314  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	191.02	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 14406.89  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 18.25  
AVERAGE FLOW DEPTH (FEET) = 11.97 TRAVEL TIME (MIN.) = 2.63  
Tc (MIN.) = 58.16  
SUBAREA AREA (ACRES) = 191.02 SUBAREA RUNOFF (CFS) = 174.26  
EFFECTIVE AREA (ACRES) = 13198.67 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 16861.2 PEAK FLOW RATE (CFS) = 14319.75  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 11.94

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 11.94 FLOW VELOCITY (FEET/SEC.) = 18.23  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11021.00 = 61764.91 FEET.

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FLOW PROCESS FROM NODE 11021.00 TO NODE 11022.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 865.22 DOWNSTREAM (FEET) = 752.60  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2892.47 CHANNEL SLOPE = 0.0389  
GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 10.88  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.297  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	320.06	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 14463.36  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 21.24  
AVERAGE FLOW DEPTH (FEET) = 10.87 TRAVEL TIME (MIN.) = 2.27  
Tc (MIN.) = 60.43  
SUBAREA AREA (ACRES) = 320.06 SUBAREA RUNOFF (CFS) = 287.21  
EFFECTIVE AREA (ACRES) = 13518.73 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 17181.2 PEAK FLOW RATE (CFS) = 14319.75  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.82

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 10.82 FLOW VELOCITY(FEET/SEC.) = 21.18  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11022.00 = 64657.38 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11022.00 TO NODE 11023.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 752.60 DOWNSTREAM(FEET) = 737.50  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1864.15 CHANNEL SLOPE = 0.0081  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 15.73  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.279  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	226.98	0.30	0.986	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.986  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14420.18  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.89  
AVERAGE FLOW DEPTH(FEET) = 15.72 TRAVEL TIME(MIN.) = 2.61  
Tc(MIN.) = 63.05  
SUBAREA AREA(ACRES) = 226.98 SUBAREA RUNOFF(CFS) = 200.86  
EFFECTIVE AREA(ACRES) = 13745.71 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 17408.2 PEAK FLOW RATE(CFS) = 14319.75  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 15.67

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 15.67 FLOW VELOCITY(FEET/SEC.) = 11.87  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11023.00 = 66521.52 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11023.00 TO NODE 11363.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 737.50 DOWNSTREAM(FEET) = 678.93  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2632.50 CHANNEL SLOPE = 0.0222  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 12.40  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.261  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	124.84	0.30	0.992	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.992  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14373.90  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 17.26  
AVERAGE FLOW DEPTH(FEET) = 12.39 TRAVEL TIME(MIN.) = 2.54  
Tc(MIN.) = 65.59  
SUBAREA AREA(ACRES) = 124.84 SUBAREA RUNOFF(CFS) = 108.30  
EFFECTIVE AREA(ACRES) = 13870.55 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 17533.1 PEAK FLOW RATE(CFS) = 14319.75  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 12.37

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 12.37 FLOW VELOCITY(FEET/SEC.) = 17.25  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11363.00 = 69154.02 FEET.

=====

END OF STUDY SUMMARY:  
TOTAL AREA(ACRES) = 17533.1 TC(MIN.) = 65.59  
EFFECTIVE AREA(ACRES) = 13870.55 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.999  
PEAK FLOW RATE(CFS) = 14319.75

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11874.63	24.58	2.051	0.30( 0.30)	1.00	4274.9	11000.00
2	13555.94	36.97	1.622	0.30( 0.30)	1.00	7319.0	10850.00
3	13652.81	37.84	1.597	0.30( 0.30)	1.00	7539.3	10800.00
4	13867.44	39.66	1.544	0.30( 0.30)	1.00	8077.3	10900.00
5	14120.57	42.76	1.490	0.30( 0.30)	1.00	8902.7	10830.00
6	14121.94	42.79	1.489	0.30( 0.30)	1.00	8909.8	10910.00
7	14127.90	43.78	1.473	0.30( 0.30)	1.00	9113.5	10630.00
8	14090.30	54.74	1.339	0.30( 0.30)	1.00	11511.9	10600.00
9	14228.13	61.37	1.291	0.30( 0.30)	1.00	12987.2	10500.00
10	14319.75	65.59	1.261	0.30( 0.30)	1.00	13870.6	10710.00
11	14315.66	67.53	1.248	0.30( 0.30)	1.00	14202.7	10410.00
12	14143.87	72.01	1.217	0.30( 0.30)	1.00	14863.7	10700.00
13	13902.44	78.72	1.171	0.30( 0.30)	1.00	15782.8	10400.00
14	13870.86	80.96	1.155	0.30( 0.30)	1.00	16052.6	10200.00
15	13650.44	86.64	1.116	0.30( 0.30)	1.00	16631.8	10300.00
16	13640.51	86.83	1.115	0.30( 0.30)	1.00	16644.6	10320.00
17	13314.82	91.42	1.087	0.30( 0.30)	1.00	16836.5	10210.00
18	11879.54	117.21	0.975	0.30( 0.30)	1.00	17533.1	10100.00

=====

END OF RATIONAL METHOD ANALYSIS

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

-----  
FILE NAME: S11.DAT  
TIME/DATE OF STUDY: 10:06 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.148
- 2) 10.00; 3.819
- 3) 15.00; 2.862
- 4) 20.00; 2.367
- 5) 25.00; 2.022
- 6) 30.00; 1.825
- 7) 40.00; 1.534
- 8) 50.00; 1.374
- 9) 60.00; 1.300
- 10) 90.00; 1.093
- 11) 120.00; 0.963
- 12) 180.00; 0.853
- 13) 360.00; 0.653
- 14) 1440.00; 0.293

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11101.00 TO NODE 11102.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 920.30  
ELEVATION DATA: UPSTREAM(FEET) = 4391.58 DOWNSTREAM(FEET) = 4080.28

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.444  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.160

SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)

NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" - 2.68 0.30 1.000 0 13.44  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 6.90  
TOTAL AREA (ACRES) = 2.68 PEAK FLOW RATE (CFS) = 6.90

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11102.00 TO NODE 11103.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 4080.28 DOWNSTREAM(FEET) = 3876.52  
CHANNEL LENGTH THRU SUBAREA(FEET) = 959.85 CHANNEL SLOPE = 0.2123  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.65  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.807

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN

USER-DEFINED - 39.96 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 52.13  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.57  
AVERAGE FLOW DEPTH(FEET) = 0.61 TRAVEL TIME(MIN.) = 2.11  
Tc(MIN.) = 15.56

SUBAREA AREA(ACRES) = 39.96 SUBAREA RUNOFF(CFS) = 90.16  
EFFECTIVE AREA(ACRES) = 42.64 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 42.6 PEAK FLOW RATE(CFS) = 96.21  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.87

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.87 FLOW VELOCITY(FEET/SEC.) = 9.36  
LONGEST FLOWPATH FROM NODE 11101.00 TO NODE 11103.00 = 1880.15 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11103.00 TO NODE 11104.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3876.52 DOWNSTREAM(FEET) = 3625.86  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1902.80 CHANNEL SLOPE = 0.1317  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.44

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.479

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	75.64	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 170.58

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.57

AVERAGE FLOW DEPTH(FEET) = 1.39 TRAVEL TIME(MIN.) = 3.31

Tc(MIN.) = 18.87

SUBAREA AREA(ACRES) = 75.64 SUBAREA RUNOFF(CFS) = 148.34

EFFECTIVE AREA(ACRES) = 118.28 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 118.3 PEAK FLOW RATE(CFS) = 231.97

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.66

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.66 FLOW VELOCITY(FEET/SEC.) = 10.50

LONGEST FLOWPATH FROM NODE 11101.00 TO NODE 11104.00 = 3782.95 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11104.00 TO NODE 11105.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3625.86 DOWNSTREAM(FEET) = 3222.66  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2898.91 CHANNEL SLOPE = 0.1391  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.19

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.175

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	167.73	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 373.86

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.36

AVERAGE FLOW DEPTH(FEET) = 2.12 TRAVEL TIME(MIN.) = 3.91

Tc(MIN.) = 22.78

SUBAREA AREA(ACRES) = 167.73 SUBAREA RUNOFF(CFS) = 283.09

EFFECTIVE AREA(ACRES) = 286.01 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 286.0 PEAK FLOW RATE(CFS) = 482.72

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.44

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.44 FLOW VELOCITY(FEET/SEC.) = 13.32

LONGEST FLOWPATH FROM NODE 11101.00 TO NODE 11105.00 = 6681.86 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11105.00 TO NODE 11121.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3222.66 DOWNSTREAM(FEET) = 2952.48  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2480.35 CHANNEL SLOPE = 0.1089  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.15

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.988

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	252.33	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 674.52

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.43

AVERAGE FLOW DEPTH(FEET) = 3.10 TRAVEL TIME(MIN.) = 3.08

Tc(MIN.) = 25.86

SUBAREA AREA(ACRES) = 252.33 SUBAREA RUNOFF(CFS) = 383.40

EFFECTIVE AREA(ACRES) = 538.34 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 538.3 PEAK FLOW RATE(CFS) = 817.98

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.43

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.43 FLOW VELOCITY(FEET/SEC.) = 14.15

LONGEST FLOWPATH FROM NODE 11101.00 TO NODE 11121.00 = 9162.21 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11105.00 TO NODE 11121.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 25.86

RAINFALL INTENSITY(INCH/HR) = 1.99

AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA(ACRES) = 538.34

TOTAL STREAM AREA(ACRES) = 538.34

PEAK FLOW RATE(CFS) AT CONFLUENCE = 817.98



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

Tc = K * [(LENGTH** 3.00) / (ELEVATION CHANGE)] ** 0.20
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 8.552
* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 4.494
SUBAREA Tc AND LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS   Tc
LAND USE           GROUP   (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"CHAPARRAL, BROADLEAF" -         1.49   0.30   1.000   0   8.55
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF (CFS) = 5.62
TOTAL AREA (ACRES) = 1.49 PEAK FLOW RATE (CFS) = 5.62

*****
FLOW PROCESS FROM NODE 11112.00 TO NODE 11113.00 IS CODE = 56
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM (FEET) = 3956.68 DOWNSTREAM (FEET) = 3752.68
CHANNEL LENGTH THRU SUBAREA (FEET) = 665.35 CHANNEL SLOPE = 0.3066
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT (FEET) = 0.35
* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 3.747
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE           GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED -         9.55   0.30   1.000 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 20.51
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.07
AVERAGE FLOW DEPTH (FEET) = 0.32 TRAVEL TIME (MIN.) = 1.83
Tc (MIN.) = 10.38
SUBAREA AREA (ACRES) = 9.55 SUBAREA RUNOFF (CFS) = 29.62
EFFECTIVE AREA (ACRES) = 11.04 AREA-AVERAGED Fm (INCH/HR) = 0.30
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA (ACRES) = 11.0 PEAK FLOW RATE (CFS) = 34.25
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT (FEET) = 0.43

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH (FEET) = 0.43 FLOW VELOCITY (FEET/SEC.) = 7.33
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11113.00 = 995.08 FEET.

*****
FLOW PROCESS FROM NODE 11113.00 TO NODE 11114.00 IS CODE = 56

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM (FEET) = 3752.68 DOWNSTREAM (FEET) = 3541.57
CHANNEL LENGTH THRU SUBAREA (FEET) = 955.83 CHANNEL SLOPE = 0.2209
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT (FEET) = 0.75
* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 3.390
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE           GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED -         26.09   0.30   1.000 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 70.58
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.54
AVERAGE FLOW DEPTH (FEET) = 0.72 TRAVEL TIME (MIN.) = 1.86
Tc (MIN.) = 12.24
SUBAREA AREA (ACRES) = 26.09 SUBAREA RUNOFF (CFS) = 72.55
EFFECTIVE AREA (ACRES) = 37.13 AREA-AVERAGED Fm (INCH/HR) = 0.30
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA (ACRES) = 37.1 PEAK FLOW RATE (CFS) = 103.25
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT (FEET) = 0.90

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH (FEET) = 0.90 FLOW VELOCITY (FEET/SEC.) = 9.68
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11114.00 = 1950.91 FEET.

*****
FLOW PROCESS FROM NODE 11114.00 TO NODE 11115.00 IS CODE = 56
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM (FEET) = 3541.57 DOWNSTREAM (FEET) = 3320.00
CHANNEL LENGTH THRU SUBAREA (FEET) = 1889.90 CHANNEL SLOPE = 0.1172
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT (FEET) = 1.46
* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.789
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE           GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED -         51.13   0.30   1.000 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 160.72
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.02
AVERAGE FLOW DEPTH (FEET) = 1.39 TRAVEL TIME (MIN.) = 3.49
Tc (MIN.) = 15.73
SUBAREA AREA (ACRES) = 51.13 SUBAREA RUNOFF (CFS) = 114.55
EFFECTIVE AREA (ACRES) = 88.26 AREA-AVERAGED Fm (INCH/HR) = 0.30
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA (ACRES) = 88.3 PEAK FLOW RATE (CFS) = 197.74

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GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.57

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.57 FLOW VELOCITY (FEET/SEC.) = 9.61  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11115.00 = 3840.81 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11115.00 TO NODE 11116.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 3320.00 DOWNSTREAM (FEET) = 3162.36  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1883.45 CHANNEL SLOPE = 0.0837  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.57  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.492

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	193.52	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 389.07  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.46  
AVERAGE FLOW DEPTH (FEET) = 2.48 TRAVEL TIME (MIN.) = 3.00  
Tc (MIN.) = 18.73  
SUBAREA AREA (ACRES) = 193.52 SUBAREA RUNOFF (CFS) = 381.83  
EFFECTIVE AREA (ACRES) = 281.78 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 281.8 PEAK FLOW RATE (CFS) = 555.98  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.00

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 3.00 FLOW VELOCITY (FEET/SEC.) = 11.57  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11116.00 = 5724.26 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11116.00 TO NODE 11117.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 3162.36 DOWNSTREAM (FEET) = 3062.66  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1903.90 CHANNEL SLOPE = 0.0524  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.73  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.240

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	112.47	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 654.21  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.21  
AVERAGE FLOW DEPTH (FEET) = 3.69 TRAVEL TIME (MIN.) = 3.11  
Tc (MIN.) = 21.84  
SUBAREA AREA (ACRES) = 112.47 SUBAREA RUNOFF (CFS) = 196.36  
EFFECTIVE AREA (ACRES) = 394.25 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 394.2 PEAK FLOW RATE (CFS) = 688.33  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.78

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 3.78 FLOW VELOCITY (FEET/SEC.) = 10.36  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11117.00 = 7628.16 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11117.00 TO NODE 11121.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 3062.66 DOWNSTREAM (FEET) = 2952.48  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1878.40 CHANNEL SLOPE = 0.0587  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.80  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.043

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	51.63	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 728.83  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.95  
AVERAGE FLOW DEPTH (FEET) = 3.79 TRAVEL TIME (MIN.) = 2.86  
Tc (MIN.) = 24.70  
SUBAREA AREA (ACRES) = 51.63 SUBAREA RUNOFF (CFS) = 80.98  
EFFECTIVE AREA (ACRES) = 445.88 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 445.9 PEAK FLOW RATE (CFS) = 699.31  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.71

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 3.71 FLOW VELOCITY (FEET/SEC.) = 10.84  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11121.00 = 9506.56 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11117.00 TO NODE 11121.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 24.70  
 RAINFALL INTENSITY(INCH/HR) = 2.04  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 445.88  
 TOTAL STREAM AREA(ACRES) = 445.88  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 699.31

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	817.98	25.86	1.988	0.30( 0.30)	1.00	538.3	11101.00
2	699.31	24.70	2.043	0.30( 0.30)	1.00	445.9	11111.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1505.89	24.70	2.043	0.30( 0.30)	1.00	960.2	11111.00
2	1495.47	25.86	1.988	0.30( 0.30)	1.00	984.2	11101.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 1505.89 Tc(MIN.) = 24.70  
 EFFECTIVE AREA(ACRES) = 960.15 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 984.2  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11121.00 = 9506.56 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11121.00 TO NODE 11122.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 2952.48 DOWNSTREAM(FEET) = 2639.37  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2687.92 CHANNEL SLOPE = 0.1165  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.79  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.933  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 170.98 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1631.54  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 17.49  
 AVERAGE FLOW DEPTH(FEET) = 4.77 TRAVEL TIME(MIN.) = 2.56  
 Tc(MIN.) = 27.26  
 SUBAREA AREA(ACRES) = 170.98 SUBAREA RUNOFF(CFS) = 251.27  
 EFFECTIVE AREA(ACRES) = 1131.13 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1155.2 PEAK FLOW RATE(CFS) = 1662.31  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.82  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.82 FLOW VELOCITY(FEET/SEC.) = 17.58  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11122.00 = 12194.48 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11122.00 TO NODE 11141.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 2639.37 DOWNSTREAM(FEET) = 1954.20  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 3696.53 CHANNEL SLOPE = 0.1854  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.40  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.820  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 114.61 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1740.70  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 21.10  
 AVERAGE FLOW DEPTH(FEET) = 4.39 TRAVEL TIME(MIN.) = 2.92  
 Tc(MIN.) = 30.18  
 SUBAREA AREA(ACRES) = 114.61 SUBAREA RUNOFF(CFS) = 156.76  
 EFFECTIVE AREA(ACRES) = 1245.74 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 1269.8 PEAK FLOW RATE(CFS) = 1703.89  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.35

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.35 FLOW VELOCITY(FEET/SEC.) = 20.98  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11141.00 = 15891.01 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11122.00 TO NODE 11141.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 =====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 30.18  
 RAINFALL INTENSITY(INCH/HR) = 1.82  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 1245.74  
 TOTAL STREAM AREA(ACRES) = 1269.81  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 1703.89

\*\*\*\*\*

FLOW PROCESS FROM NODE 11130.00 TO NODE 11131.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH (FEET) = 259.85
ELEVATION DATA: UPSTREAM (FEET) = 3923.93 DOWNSTREAM (FEET) = 3765.35

Tc = K \* [(LENGTH\*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 7.204
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 5.121
SUBAREA Tc AND LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"CHAPARRAL, NARROWLEAF" - 1.27 0.30 1.000 0 7.20
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF (CFS) = 5.51
TOTAL AREA (ACRES) = 1.27 PEAK FLOW RATE (CFS) = 5.51

\*\*\*\*\*

FLOW PROCESS FROM NODE 11131.00 TO NODE 11132.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 3765.35 DOWNSTREAM (FEET) = 3414.86
CHANNEL LENGTH THRU SUBAREA (FEET) = 674.05 CHANNEL SLOPE = 0.5200
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.26
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 4.345
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 6.52 0.30 1.000 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 17.48
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.75
AVERAGE FLOW DEPTH (FEET) = 0.25 TRAVEL TIME (MIN.) = 1.67
Tc (MIN.) = 8.87
SUBAREA AREA (ACRES) = 6.52 SUBAREA RUNOFF (CFS) = 23.74
EFFECTIVE AREA (ACRES) = 7.79 AREA-AVERAGED Fm (INCH/HR) = 0.30
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA (ACRES) = 7.8 PEAK FLOW RATE (CFS) = 28.36
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.33

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH (FEET) = 0.33 FLOW VELOCITY (FEET/SEC.) = 8.04
LONGEST FLOWPATH FROM NODE 11130.00 TO NODE 11132.00 = 933.90 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11132.00 TO NODE 11133.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 3414.86 DOWNSTREAM (FEET) = 2699.51
CHANNEL LENGTH THRU SUBAREA (FEET) = 1813.44 CHANNEL SLOPE = 0.3945
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.77
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 3.518
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 41.63 0.30 1.000 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 89.13
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.19
AVERAGE FLOW DEPTH (FEET) = 0.70 TRAVEL TIME (MIN.) = 2.70
Tc (MIN.) = 11.57
SUBAREA AREA (ACRES) = 41.63 SUBAREA RUNOFF (CFS) = 120.58
EFFECTIVE AREA (ACRES) = 49.42 AREA-AVERAGED Fm (INCH/HR) = 0.30
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA (ACRES) = 49.4 PEAK FLOW RATE (CFS) = 143.14
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.92

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH (FEET) = 0.92 FLOW VELOCITY (FEET/SEC.) = 13.14
LONGEST FLOWPATH FROM NODE 11130.00 TO NODE 11133.00 = 2747.34 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11133.00 TO NODE 11134.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 2699.51 DOWNSTREAM (FEET) = 2464.06
CHANNEL LENGTH THRU SUBAREA (FEET) = 1053.33 CHANNEL SLOPE = 0.2235
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.80
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 3.281
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 142.85 0.30 1.000 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 334.96
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 14.16
AVERAGE FLOW DEPTH (FEET) = 1.75 TRAVEL TIME (MIN.) = 1.24
Tc (MIN.) = 12.81
SUBAREA AREA (ACRES) = 142.85 SUBAREA RUNOFF (CFS) = 383.24
EFFECTIVE AREA (ACRES) = 192.27 AREA-AVERAGED Fm (INCH/HR) = 0.30
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 192.3 PEAK FLOW RATE (CFS) = 515.83  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.22 FLOW VELOCITY (FEET/SEC.) = 16.06  
 LONGEST FLOWPATH FROM NODE 11130.00 TO NODE 11134.00 = 3800.67 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11134.00 TO NODE 11141.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2464.06 DOWNSTREAM (FEET) = 1954.20  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1291.98 CHANNEL SLOPE = 0.3946  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.97

\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 3.075

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	24.58	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 546.53  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 19.98  
 AVERAGE FLOW DEPTH (FEET) = 1.96 TRAVEL TIME (MIN.) = 1.08  
 Tc (MIN.) = 13.89  
 SUBAREA AREA (ACRES) = 24.58 SUBAREA RUNOFF (CFS) = 61.38  
 EFFECTIVE AREA (ACRES) = 216.85 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 216.9 PEAK FLOW RATE (CFS) = 541.52  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.96

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.96 FLOW VELOCITY (FEET/SEC.) = 19.90  
 LONGEST FLOWPATH FROM NODE 11130.00 TO NODE 11141.00 = 5092.65 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11134.00 TO NODE 11141.00 IS CODE = 1

-----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION (MIN.) = 13.89  
 RAINFALL INTENSITY (INCH/HR) = 3.07  
 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA (ACRES) = 216.85  
 TOTAL STREAM AREA (ACRES) = 216.85

PEAK FLOW RATE (CFS) AT CONFLUENCE = 541.52

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1703.89	30.18	1.820	0.30 ( 0.30)	1.00	1245.7	11111.00
1	1698.02	31.35	1.786	0.30 ( 0.30)	1.00	1269.8	11101.00
2	541.52	13.89	3.075	0.30 ( 0.30)	1.00	216.9	11130.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1973.04	13.89	3.075	0.30 ( 0.30)	1.00	790.1	11130.00
2	2000.49	30.18	1.820	0.30 ( 0.30)	1.00	1462.6	11111.00
3	1988.00	31.35	1.786	0.30 ( 0.30)	1.00	1486.7	11101.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 2000.49 Tc (MIN.) = 30.18  
 EFFECTIVE AREA (ACRES) = 1462.59 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 1486.7  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11141.00 = 15891.01 FEET.

=====

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 1486.7 TC (MIN.) = 30.18  
 EFFECTIVE AREA (ACRES) = 1462.59 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.000  
 PEAK FLOW RATE (CFS) = 2000.49

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1973.04	13.89	3.075	0.30 ( 0.30)	1.00	790.1	11130.00
2	2000.49	30.18	1.820	0.30 ( 0.30)	1.00	1462.6	11111.00
3	1988.00	31.35	1.786	0.30 ( 0.30)	1.00	1486.7	11101.00

=====

END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*

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

Analysis prepared by:

-----  
FILE NAME: S12.DAT  
TIME/DATE OF STUDY: 10:07 04/01/2013  
=====

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-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.148
- 2) 10.00; 3.819
- 3) 15.00; 2.862
- 4) 20.00; 2.367
- 5) 25.00; 2.022
- 6) 30.00; 1.825
- 7) 40.00; 1.534
- 8) 50.00; 1.374
- 9) 60.00; 1.300
- 10) 90.00; 1.093
- 11) 120.00; 0.963
- 12) 180.00; 0.853
- 13) 360.00; 0.653
- 14) 1440.00; 0.293

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11220.00 TO NODE 11221.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 762.39  
ELEVATION DATA: UPSTREAM(FEET) = 3797.72 DOWNSTREAM(FEET) = 3296.86

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.919  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.643  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	5.02	0.30	1.000	0	10.92

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 15.10  
TOTAL AREA(ACRES) = 5.02 PEAK FLOW RATE(CFS) = 15.10

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11221.00 TO NODE 11223.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3296.86 DOWNSTREAM(FEET) = 2738.96  
CHANNEL LENGTH THRU SUBAREA(FEET) = 912.82 CHANNEL SLOPE = 0.6112  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.46  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.369  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	26.44	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 51.69  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.61  
AVERAGE FLOW DEPTH(FEET) = 0.45 TRAVEL TIME(MIN.) = 1.43  
Tc(MIN.) = 12.35  
SUBAREA AREA(ACRES) = 26.44 SUBAREA RUNOFF(CFS) = 73.02  
EFFECTIVE AREA(ACRES) = 31.46 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 31.5 PEAK FLOW RATE(CFS) = 86.89  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.61

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.61 FLOW VELOCITY(FEET/SEC.) = 12.75  
LONGEST FLOWPATH FROM NODE 11220.00 TO NODE 11223.00 = 1675.21 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11223.00 TO NODE 11224.00 IS CODE = 56  
=====

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2738.96 DOWNSTREAM(FEET) = 2370.12  
CHANNEL LENGTH THRU SUBAREA(FEET) = 959.79 CHANNEL SLOPE = 0.3843  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.13  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.155  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	82.44	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 192.92  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.32  
AVERAGE FLOW DEPTH(FEET) = 1.10 TRAVEL TIME(MIN.) = 1.12  
Tc(MIN.) = 13.47  
SUBAREA AREA(ACRES) = 82.44 SUBAREA RUNOFF(CFS) = 211.83  
EFFECTIVE AREA(ACRES) = 113.90 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 113.9 PEAK FLOW RATE(CFS) = 292.67  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.40

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.40 FLOW VELOCITY(FEET/SEC.) = 16.35  
LONGEST FLOWPATH FROM NODE 11220.00 TO NODE 11224.00 = 2635.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11224.00 TO NODE 11231.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2370.12 DOWNSTREAM(FEET) = 1794.01  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2223.40 CHANNEL SLOPE = 0.2591  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.78  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.773  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	61.93	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 361.65  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.22  
AVERAGE FLOW DEPTH(FEET) = 1.76 TRAVEL TIME(MIN.) = 2.43  
Tc(MIN.) = 15.90  
SUBAREA AREA(ACRES) = 61.93 SUBAREA RUNOFF(CFS) = 137.82  
EFFECTIVE AREA(ACRES) = 175.83 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 175.8 PEAK FLOW RATE(CFS) = 391.28

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.83

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.83 FLOW VELOCITY(FEET/SEC.) = 15.61  
LONGEST FLOWPATH FROM NODE 11220.00 TO NODE 11231.00 = 4858.40 FEET.

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

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

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11141.00 TO NODE 11141.00 IS CODE = 15.1

-----  
>>>>DEFINE MEMORY BANK # 2<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: S11.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1973.04	13.89	0.30( 0.30)	1.00	790.1	11130.00
2	2000.49	30.18	0.30( 0.30)	1.00	1462.6	11111.00
3	1988.00	31.35	0.30( 0.30)	1.00	1486.7	11101.00
TOTAL AREA(ACRES) =						1486.7

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11141.00 TO NODE 11141.00 IS CODE = 14.0

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>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<

=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1973.04	13.89	0.30( 0.30)	1.00	790.1	11130.00
2	2000.49	30.18	0.30( 0.30)	1.00	1462.6	11111.00
3	1988.00	31.35	0.30( 0.30)	1.00	1486.7	11101.00
TOTAL AREA(ACRES) =						1486.7

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11141.00 TO NODE 11231.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1954.20 DOWNSTREAM(FEET) = 1794.01  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1435.64 CHANNEL SLOPE = 0.1116  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.41  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.782  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	89.78	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2060.35  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 18.31  
 AVERAGE FLOW DEPTH(FEET) = 5.41 TRAVEL TIME(MIN.) = 1.31  
 Tc(MIN.) = 31.49  
 SUBAREA AREA(ACRES) = 89.78 SUBAREA RUNOFF(CFS) = 119.73  
 EFFECTIVE AREA(ACRES) = 1552.37 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 1576.4 PEAK FLOW RATE(CFS) = 2070.16  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.42

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 5.42 FLOW VELOCITY(FEET/SEC.) = 18.33  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11231.00 = 17326.65 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11224.00 TO NODE 11231.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2013.68	15.19	2.843	0.30( 0.30)	1.00	879.9	11130.00
2	2070.16	31.49	1.782	0.30( 0.30)	1.00	1552.4	11111.00
3	2054.00	32.66	1.748	0.30( 0.30)	1.00	1576.4	11101.00

LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11231.00 = 17326.65 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	391.28	15.90	2.773	0.30( 0.30)	1.00	175.8	11220.00

LONGEST FLOWPATH FROM NODE 11220.00 TO NODE 11231.00 = 4858.40 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2398.12	15.19	2.843	0.30( 0.30)	1.00	1047.9	11130.00
2	2407.42	15.90	2.773	0.30( 0.30)	1.00	1085.0	11220.00
3	2304.64	31.49	1.782	0.30( 0.30)	1.00	1728.2	11111.00
4	2283.10	32.66	1.748	0.30( 0.30)	1.00	1752.3	11101.00

TOTAL AREA(ACRES) = 1752.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 2407.42 Tc(MIN.) = 15.904  
 EFFECTIVE AREA(ACRES) = 1085.00 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 1752.3  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11231.00 = 17326.65 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11231.00 TO NODE 11241.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1794.01 DOWNSTREAM(FEET) = 1680.94  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1933.84 CHANNEL SLOPE = 0.0585  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 6.88  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.561

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	59.78	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2468.26  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.11  
 AVERAGE FLOW DEPTH(FEET) = 6.88 TRAVEL TIME(MIN.) = 2.13  
 Tc(MIN.) = 18.04

SUBAREA AREA(ACRES) = 59.78 SUBAREA RUNOFF(CFS) = 121.67  
 EFFECTIVE AREA(ACRES) = 1144.78 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 1812.1 PEAK FLOW RATE(CFS) = 2407.42

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 6.79

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 6.79 FLOW VELOCITY(FEET/SEC.) = 15.02  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11241.00 = 19260.49 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11231.00 TO NODE 11241.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 18.04  
 RAINFALL INTENSITY(INCH/HR) = 2.56  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 1144.78  
 TOTAL STREAM AREA(ACRES) = 1812.05  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 2407.42

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11201.00 TO NODE 11202.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 986.34  
 ELEVATION DATA: UPSTREAM(FEET) = 3383.22 DOWNSTREAM(FEET) = 3248.87

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.343



\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.562  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
 PUBLIC PARK - 8.54 0.30 1.000 0 11.34  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 25.07  
 TOTAL AREA(ACRES) = 8.54 PEAK FLOW RATE(CFS) = 25.07

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11202.00 TO NODE 11203.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3248.87 DOWNSTREAM(FEET) = 3198.08  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 922.69 CHANNEL SLOPE = 0.0550  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.99  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.965

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 24.42 0.30 1.000 -

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 54.59  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.93  
 AVERAGE FLOW DEPTH(FEET) = 0.93 TRAVEL TIME(MIN.) = 3.12  
 Tc(MIN.) = 14.46

SUBAREA AREA(ACRES) = 24.42 SUBAREA RUNOFF(CFS) = 58.56  
 EFFECTIVE AREA(ACRES) = 32.96 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 33.0 PEAK FLOW RATE(CFS) = 79.04  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.15

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.15 FLOW VELOCITY(FEET/SEC.) = 5.56  
 LONGEST FLOWPATH FROM NODE 11201.00 TO NODE 11203.00 = 1909.03 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11203.00 TO NODE 11204.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3198.08 DOWNSTREAM(FEET) = 3062.48  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1941.08 CHANNEL SLOPE = 0.0699  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.39  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.445

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 37.67 0.30 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 115.59  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.82  
 AVERAGE FLOW DEPTH(FEET) = 1.34 TRAVEL TIME(MIN.) = 4.75  
 Tc(MIN.) = 19.21  
 SUBAREA AREA(ACRES) = 37.67 SUBAREA RUNOFF(CFS) = 72.73  
 EFFECTIVE AREA(ACRES) = 70.63 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 70.6 PEAK FLOW RATE(CFS) = 136.36  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.47

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.47 FLOW VELOCITY(FEET/SEC.) = 7.17  
 LONGEST FLOWPATH FROM NODE 11201.00 TO NODE 11204.00 = 3850.11 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11204.00 TO NODE 11205.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3062.48 DOWNSTREAM(FEET) = 2940.56  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1916.73 CHANNEL SLOPE = 0.0636  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.71  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.123

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 34.87 0.30 1.000 -

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 165.00  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.38  
 AVERAGE FLOW DEPTH(FEET) = 1.68 TRAVEL TIME(MIN.) = 4.33  
 Tc(MIN.) = 23.54

SUBAREA AREA(ACRES) = 34.87 SUBAREA RUNOFF(CFS) = 57.20  
 EFFECTIVE AREA(ACRES) = 105.50 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 105.5 PEAK FLOW RATE(CFS) = 173.06  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.72

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.72 FLOW VELOCITY(FEET/SEC.) = 7.48  
 LONGEST FLOWPATH FROM NODE 11201.00 TO NODE 11205.00 = 5766.84 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11205.00 TO NODE 11206.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2940.56 DOWNSTREAM(FEET) = 2581.93  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2865.58 CHANNEL SLOPE = 0.1252  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.63

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.892

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	56.17	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 213.35

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.06

AVERAGE FLOW DEPTH(FEET) = 1.61 TRAVEL TIME(MIN.) = 4.75

Tc(MIN.) = 28.29

SUBAREA AREA(ACRES) = 56.17 SUBAREA RUNOFF(CFS) = 80.51

EFFECTIVE AREA(ACRES) = 161.67 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 161.7 PEAK FLOW RATE(CFS) = 231.71

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.68

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.68 FLOW VELOCITY(FEET/SEC.) = 10.31

LONGEST FLOWPATH FROM NODE 11201.00 TO NODE 11206.00 = 8632.42 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11206.00 TO NODE 11207.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2581.93 DOWNSTREAM(FEET) = 2317.20  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1985.44 CHANNEL SLOPE = 0.1333  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.82

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.806

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	546.87	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 602.51

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.98

AVERAGE FLOW DEPTH(FEET) = 2.77 TRAVEL TIME(MIN.) = 2.37

Tc(MIN.) = 30.66

SUBAREA AREA(ACRES) = 546.87 SUBAREA RUNOFF(CFS) = 741.22

EFFECTIVE AREA(ACRES) = 708.54 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 708.5 PEAK FLOW RATE(CFS) = 960.35

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.54

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.54 FLOW VELOCITY(FEET/SEC.) = 15.91

LONGEST FLOWPATH FROM NODE 11201.00 TO NODE 11207.00 = 10617.86 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11207.00 TO NODE 11241.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2317.20 DOWNSTREAM(FEET) = 1680.94  
CHANNEL LENGTH THRU SUBAREA(FEET) = 4085.95 CHANNEL SLOPE = 0.1557  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.84

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.695

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	389.75	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1205.20

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 17.94

AVERAGE FLOW DEPTH(FEET) = 3.81 TRAVEL TIME(MIN.) = 3.80

Tc(MIN.) = 34.45

SUBAREA AREA(ACRES) = 389.75 SUBAREA RUNOFF(CFS) = 489.52

EFFECTIVE AREA(ACRES) = 1098.29 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1098.3 PEAK FLOW RATE(CFS) = 1379.43

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.08

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 4.08 FLOW VELOCITY(FEET/SEC.) = 18.59

LONGEST FLOWPATH FROM NODE 11201.00 TO NODE 11241.00 = 14703.81 FEET.

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FLOW PROCESS FROM NODE 11207.00 TO NODE 11241.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 34.45

RAINFALL INTENSITY(INCH/HR) = 1.70

AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA(ACRES) = 1098.29

TOTAL STREAM AREA(ACRES) = 1098.29

PEAK FLOW RATE(CFS) AT CONFLUENCE = 1379.43

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2398.12	17.33	2.631	0.30( 0.30)	1.00	1107.6	11130.00
1	2407.42	18.04	2.561	0.30( 0.30)	1.00	1144.8	11220.00
1	2304.64	33.65	1.719	0.30( 0.30)	1.00	1788.0	11111.00
1	2283.10	34.83	1.685	0.30( 0.30)	1.00	1812.1	11101.00
2	1379.43	34.45	1.695	0.30( 0.30)	1.00	1098.3	11201.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3557.34	17.33	2.631	0.30( 0.30)	1.00	1660.1	11130.00
2	3577.71	18.04	2.561	0.30( 0.30)	1.00	1719.8	11220.00
3	3674.51	33.65	1.719	0.30( 0.30)	1.00	2860.8	11111.00
4	3669.39	34.45	1.695	0.30( 0.30)	1.00	2902.7	11201.00
5	3651.77	34.83	1.685	0.30( 0.30)	1.00	2910.3	11101.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 3674.51 Tc(MIN.) = 33.65  
EFFECTIVE AREA(ACRES) = 2860.77 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 2910.3  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11241.00 = 19260.49 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11241.00 TO NODE 11242.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1680.94 DOWNSTREAM(FEET) = 1521.21  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1795.61 CHANNEL SLOPE = 0.0890  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.63  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.675

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	198.62	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3797.38  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 19.73  
AVERAGE FLOW DEPTH(FEET) = 7.62 TRAVEL TIME(MIN.) = 1.52  
Tc(MIN.) = 35.17  
SUBAREA AREA(ACRES) = 198.62 SUBAREA RUNOFF(CFS) = 245.73  
EFFECTIVE AREA(ACRES) = 3059.39 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 3109.0 PEAK FLOW RATE(CFS) = 3785.07  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.61

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 7.61 FLOW VELOCITY(FEET/SEC.) = 19.72  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11242.00 = 21056.10 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11242.00 TO NODE 11261.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1521.21 DOWNSTREAM(FEET) = 1343.95  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2223.33 CHANNEL SLOPE = 0.0797  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.86  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.618

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	95.39	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3841.64  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 19.00  
AVERAGE FLOW DEPTH(FEET) = 7.86 TRAVEL TIME(MIN.) = 1.95  
Tc(MIN.) = 37.12

SUBAREA AREA(ACRES) = 95.39 SUBAREA RUNOFF(CFS) = 113.14  
EFFECTIVE AREA(ACRES) = 3154.78 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 3204.3 PEAK FLOW RATE(CFS) = 3785.07

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.81

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 7.81 FLOW VELOCITY(FEET/SEC.) = 18.93  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11261.00 = 23279.43 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11242.00 TO NODE 11261.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 37.12  
RAINFALL INTENSITY(INCH/HR) = 1.62  
AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 3154.78  
TOTAL STREAM AREA(ACRES) = 3204.35  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 3785.07

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11250.00 TO NODE 11251.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH (FEET) = 982.50  
ELEVATION DATA: UPSTREAM (FEET) = 3806.44 DOWNSTREAM (FEET) = 3168.25

Tc = K \* [(LENGTH\*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20  
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 12.112  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 3.415  
SUBAREA Tc AND LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL, BROADLEAF" - 5.91 0.30 1.000 0 12.11  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF (CFS) = 16.57  
TOTAL AREA (ACRES) = 5.91 PEAK FLOW RATE (CFS) = 16.57

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11251.00 TO NODE 11252.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 3168.25 DOWNSTREAM (FEET) = 2683.24  
CHANNEL LENGTH THRU SUBAREA (FEET) = 925.62 CHANNEL SLOPE = 0.5240  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\* ESTIMATED CHANNEL HEIGHT (FEET) = 0.38  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 3.074  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 13.73 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 33.75  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.66  
AVERAGE FLOW DEPTH (FEET) = 0.36 TRAVEL TIME (MIN.) = 1.78  
Tc (MIN.) = 13.89  
SUBAREA AREA (ACRES) = 13.73 SUBAREA RUNOFF (CFS) = 34.28  
EFFECTIVE AREA (ACRES) = 19.64 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 19.6 PEAK FLOW RATE (CFS) = 49.03  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\* ESTIMATED CHANNEL HEIGHT (FEET) = 0.45

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.45 FLOW VELOCITY (FEET/SEC.) = 9.92  
LONGEST FLOWPATH FROM NODE 11250.00 TO NODE 11252.00 = 1908.12 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11252.00 TO NODE 11253.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 2683.24 DOWNSTREAM (FEET) = 2334.26  
CHANNEL LENGTH THRU SUBAREA (FEET) = 944.66 CHANNEL SLOPE = 0.3694  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\* ESTIMATED CHANNEL HEIGHT (FEET) = 0.84  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.840

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 55.67 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 112.72  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.82  
AVERAGE FLOW DEPTH (FEET) = 0.82 TRAVEL TIME (MIN.) = 1.33  
Tc (MIN.) = 15.23  
SUBAREA AREA (ACRES) = 55.67 SUBAREA RUNOFF (CFS) = 127.25  
EFFECTIVE AREA (ACRES) = 75.31 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 75.3 PEAK FLOW RATE (CFS) = 172.14  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\* ESTIMATED CHANNEL HEIGHT (FEET) = 1.04

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.04 FLOW VELOCITY (FEET/SEC.) = 13.67  
LONGEST FLOWPATH FROM NODE 11250.00 TO NODE 11253.00 = 2852.78 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11253.00 TO NODE 11254.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 2334.26 DOWNSTREAM (FEET) = 1768.11  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2293.59 CHANNEL SLOPE = 0.2468  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\* ESTIMATED CHANNEL HEIGHT (FEET) = 1.78  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.583  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 165.43 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 342.38  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 14.73  
AVERAGE FLOW DEPTH (FEET) = 1.73 TRAVEL TIME (MIN.) = 2.59  
Tc (MIN.) = 17.82  
SUBAREA AREA (ACRES) = 165.43 SUBAREA RUNOFF (CFS) = 339.90  
EFFECTIVE AREA (ACRES) = 240.74 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 240.7 PEAK FLOW RATE (CFS) = 494.63  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\* ESTIMATED CHANNEL HEIGHT (FEET) = 2.12

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.12 FLOW VELOCITY(FEET/SEC.) = 16.42  
 LONGEST FLOWPATH FROM NODE 11250.00 TO NODE 11254.00 = 5146.37 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11254.00 TO NODE 11255.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 1768.11 DOWNSTREAM(FEET) = 1506.97  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1897.59 CHANNEL SLOPE = 0.1376  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.96  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.369

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	194.55	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 675.87  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.62  
 AVERAGE FLOW DEPTH(FEET) = 2.92 TRAVEL TIME(MIN.) = 2.16  
 Tc(MIN.) = 19.98  
 SUBAREA AREA(ACRES) = 194.55 SUBAREA RUNOFF(CFS) = 362.22  
 EFFECTIVE AREA(ACRES) = 435.29 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 435.3 PEAK FLOW RATE(CFS) = 810.45  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.21

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.21 FLOW VELOCITY(FEET/SEC.) = 15.38  
 LONGEST FLOWPATH FROM NODE 11250.00 TO NODE 11255.00 = 7043.96 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11255.00 TO NODE 11261.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 1506.97 DOWNSTREAM(FEET) = 1343.95  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 882.10 CHANNEL SLOPE = 0.1848  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.21  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.311

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	137.86	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 935.22  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 17.81

AVERAGE FLOW DEPTH(FEET) = 3.20 TRAVEL TIME(MIN.) = 0.83  
 Tc(MIN.) = 20.81  
 SUBAREA AREA(ACRES) = 137.86 SUBAREA RUNOFF(CFS) = 249.55  
 EFFECTIVE AREA(ACRES) = 573.15 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 573.1 PEAK FLOW RATE(CFS) = 1037.48  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.38

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.38 FLOW VELOCITY(FEET/SEC.) = 18.29  
 LONGEST FLOWPATH FROM NODE 11250.00 TO NODE 11261.00 = 7926.06 FEET.

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FLOW PROCESS FROM NODE 11255.00 TO NODE 11261.00 IS CODE = 1

-----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

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TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 20.81  
 RAINFALL INTENSITY(INCH/HR) = 2.31  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 573.15  
 TOTAL STREAM AREA(ACRES) = 573.15  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 1037.48

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3648.19	20.81	2.311	0.30( 0.30)	1.00	1954.1	11130.00
1	3644.71	21.52	2.262	0.30( 0.30)	1.00	2013.8	11220.00
1	3785.07	37.12	1.618	0.30( 0.30)	1.00	3154.8	11111.00
1	3771.90	37.92	1.594	0.30( 0.30)	1.00	3196.7	11201.00
1	3750.56	38.30	1.583	0.30( 0.30)	1.00	3204.3	11101.00
2	1037.48	20.81	2.311	0.30( 0.30)	1.00	573.1	11250.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4685.39	20.81	2.311	0.30( 0.30)	1.00	2526.7	11250.00
2	4685.47	20.81	2.311	0.30( 0.30)	1.00	2527.3	11130.00
3	4656.80	21.52	2.262	0.30( 0.30)	1.00	2586.9	11220.00
4	4464.90	37.12	1.618	0.30( 0.30)	1.00	3727.9	11111.00
5	4439.67	37.92	1.594	0.30( 0.30)	1.00	3769.8	11201.00
6	4412.66	38.30	1.583	0.30( 0.30)	1.00	3777.5	11101.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 4685.47 Tc(MIN.) = 20.81  
 EFFECTIVE AREA(ACRES) = 2527.25 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 3777.5  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11261.00 = 23279.43 FEET.

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FLOW PROCESS FROM NODE 11261.00 TO NODE 11310.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 1343.95 DOWNSTREAM (FEET) = 1299.17  
CHANNEL LENGTH THRU SUBAREA (FEET) = 889.38 CHANNEL SLOPE = 0.0503  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 9.62  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.250

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
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USER-DEFINED	-	79.65	0.30	1.000	-
--------------	---	-------	------	-------	---

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 4755.38

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 16.91

AVERAGE FLOW DEPTH (FEET) = 9.62 TRAVEL TIME (MIN.) = 0.88

Tc (MIN.) = 21.69

SUBAREA AREA (ACRES) = 79.65 SUBAREA RUNOFF (CFS) = 139.81

EFFECTIVE AREA (ACRES) = 2606.90 AREA-AVERAGED Fm (INCH/HR) = 0.30

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 3857.1 PEAK FLOW RATE (CFS) = 4685.47

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 9.56

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 9.56 FLOW VELOCITY (FEET/SEC.) = 16.84

LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11310.00 = 24168.81 FEET.

-----  
END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 3857.1 TC (MIN.) = 21.69

EFFECTIVE AREA (ACRES) = 2606.90 AREA-AVERAGED Fm (INCH/HR) = 0.30

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.000

PEAK FLOW RATE (CFS) = 4685.47

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4685.39	21.69	2.251	0.30 ( 0.30)	1.00	2606.4	11250.00
2	4685.47	21.69	2.250	0.30 ( 0.30)	1.00	2606.9	11130.00
3	4656.80	22.40	2.201	0.30 ( 0.30)	1.00	2666.6	11220.00
4	4464.90	38.01	1.592	0.30 ( 0.30)	1.00	3807.6	11111.00
5	4439.67	38.81	1.569	0.30 ( 0.30)	1.00	3849.5	11201.00
6	4412.66	39.19	1.558	0.30 ( 0.30)	1.00	3857.1	11101.00

-----  
END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

-----  
FILE NAME: S13.DAT  
TIME/DATE OF STUDY: 10:07 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.148
- 2) 10.00; 3.819
- 3) 15.00; 2.862
- 4) 20.00; 2.367
- 5) 25.00; 2.022
- 6) 30.00; 1.825
- 7) 40.00; 1.534
- 8) 50.00; 1.374
- 9) 60.00; 1.300
- 10) 90.00; 1.093
- 11) 120.00; 0.963
- 12) 180.00; 0.853
- 13) 360.00; 0.653
- 14) 1440.00; 0.293

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11300.00 TO NODE 11301.00 IS CODE = 21  
-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 455.90  
ELEVATION DATA: UPSTREAM(FEET) = 3394.67 DOWNSTREAM(FEET) = 3247.06

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$   
SUBAREA ANALYSIS USED MINIMUM  $T_c$ (MIN.) = 10.240  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.773

SUBAREA  $T_c$  AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES)  $F_p$  (INCH/HR)  $A_p$  (DECIMAL) SCS CN  $T_c$  (MIN.)

NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 2.53 0.30 1.000 0 10.24  
SUBAREA AVERAGE PERVIOUS LOSS RATE,  $F_p$ (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION,  $A_p$  = 1.000  
SUBAREA RUNOFF(CFS) = 7.91  
TOTAL AREA (ACRES) = 2.53 PEAK FLOW RATE (CFS) = 7.91

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11301.00 TO NODE 11301.50 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3247.06 DOWNSTREAM(FEET) = 3150.57  
CHANNEL LENGTH THRU SUBAREA(FEET) = 468.69 CHANNEL SLOPE = 0.2059  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.40  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.507

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES)  $F_p$  (INCH/HR)  $A_p$  (DECIMAL) SCS CN

USER-DEFINED - 10.95 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE,  $F_p$ (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION,  $A_p$  = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 23.75  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.62  
AVERAGE FLOW DEPTH(FEET) = 0.39 TRAVEL TIME(MIN.) = 1.39  
 $T_c$ (MIN.) = 11.63

SUBAREA AREA(ACRES) = 10.95 SUBAREA RUNOFF(CFS) = 31.60  
EFFECTIVE AREA(ACRES) = 13.48 AREA-AVERAGED  $F_m$ (INCH/HR) = 0.30  
AREA-AVERAGED  $F_p$ (INCH/HR) = 0.30 AREA-AVERAGED  $A_p$  = 1.00  
TOTAL AREA(ACRES) = 13.5 PEAK FLOW RATE(CFS) = 38.91  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.52

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.52 FLOW VELOCITY(FEET/SEC.) = 6.75  
LONGEST FLOWPATH FROM NODE 11300.00 TO NODE 11301.50 = 924.59 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11301.50 TO NODE 11302.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3150.57 DOWNSTREAM(FEET) = 2840.04  
CHANNEL LENGTH THRU SUBAREA(FEET) = 982.20 CHANNEL SLOPE = 0.3162  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.55

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.141

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	9.59	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 51.17

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.57

AVERAGE FLOW DEPTH(FEET) = 0.54 TRAVEL TIME(MIN.) = 1.91

Tc(MIN.) = 13.54

SUBAREA AREA(ACRES) = 9.59 SUBAREA RUNOFF(CFS) = 24.53

EFFECTIVE AREA(ACRES) = 23.07 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 23.1 PEAK FLOW RATE(CFS) = 59.00

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.58

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.58 FLOW VELOCITY(FEET/SEC.) = 9.04

LONGEST FLOWPATH FROM NODE 11300.00 TO NODE 11302.00 = 1906.79 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11302.00 TO NODE 11303.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2840.04 DOWNSTREAM(FEET) = 2177.16  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1916.03 CHANNEL SLOPE = 0.3460  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.05

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.759

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	84.31	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 152.57

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.79

AVERAGE FLOW DEPTH(FEET) = 0.99 TRAVEL TIME(MIN.) = 2.50

Tc(MIN.) = 16.04

SUBAREA AREA(ACRES) = 84.31 SUBAREA RUNOFF(CFS) = 186.62

EFFECTIVE AREA(ACRES) = 107.38 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 107.4 PEAK FLOW RATE(CFS) = 237.69

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.28

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.28 FLOW VELOCITY(FEET/SEC.) = 14.80

LONGEST FLOWPATH FROM NODE 11300.00 TO NODE 11303.00 = 3822.82 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11303.00 TO NODE 11304.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2177.16 DOWNSTREAM(FEET) = 1612.27  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2472.34 CHANNEL SLOPE = 0.2285  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.78

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.473

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	99.61	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 335.25

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.25

AVERAGE FLOW DEPTH(FEET) = 1.74 TRAVEL TIME(MIN.) = 2.89

Tc(MIN.) = 18.93

SUBAREA AREA(ACRES) = 99.61 SUBAREA RUNOFF(CFS) = 194.83

EFFECTIVE AREA(ACRES) = 206.99 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 207.0 PEAK FLOW RATE(CFS) = 404.85

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.94

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.94 FLOW VELOCITY(FEET/SEC.) = 15.08

LONGEST FLOWPATH FROM NODE 11300.00 TO NODE 11304.00 = 6295.16 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11304.00 TO NODE 11320.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1612.27 DOWNSTREAM(FEET) = 1222.10  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2432.96 CHANNEL SLOPE = 0.1604  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.28

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.238

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	53.86	0.30	1.000	-



SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 451.83  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.76  
 AVERAGE FLOW DEPTH(FEET) = 2.26 TRAVEL TIME(MIN.) = 2.95  
 Tc(MIN.) = 21.87  
 SUBAREA AREA(ACRES) = 53.86 SUBAREA RUNOFF(CFS) = 93.93  
 EFFECTIVE AREA(ACRES) = 260.85 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 260.8 PEAK FLOW RATE(CFS) = 454.90  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.27

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.27 FLOW VELOCITY(FEET/SEC.) = 13.78  
 LONGEST FLOWPATH FROM NODE 11300.00 TO NODE 11320.00 = 8728.12 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11304.00 TO NODE 11320.00 IS CODE = 10  
 -----

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

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11261.00 TO NODE 11310.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 2 <<<<<<  
 =====

PEAK FLOWRATE TABLE FILE NAME: S12.DNA  
 MEMORY BANK # 2 DEFINED AS FOLLOWS:  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4685.39	21.69	0.30 ( 0.30)	1.00	2606.4	11250.00
2	4685.47	21.69	0.30 ( 0.30)	1.00	2606.9	11130.00
3	4656.80	22.40	0.30 ( 0.30)	1.00	2666.6	11220.00
4	4464.90	38.01	0.30 ( 0.30)	1.00	3807.6	11111.00
5	4439.67	38.81	0.30 ( 0.30)	1.00	3849.5	11201.00
6	4412.66	39.19	0.30 ( 0.30)	1.00	3857.1	11101.00
TOTAL AREA(ACRES) =						3857.1

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11261.00 TO NODE 11310.00 IS CODE = 14.0  
 -----

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
 =====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4685.39	21.69	0.30 ( 0.30)	1.00	2606.4	11250.00
2	4685.47	21.69	0.30 ( 0.30)	1.00	2606.9	11130.00
3	4656.80	22.40	0.30 ( 0.30)	1.00	2666.6	11220.00
4	4464.90	38.01	0.30 ( 0.30)	1.00	3807.6	11111.00
5	4439.67	38.81	0.30 ( 0.30)	1.00	3849.5	11201.00
6	4412.66	39.19	0.30 ( 0.30)	1.00	3857.1	11101.00
TOTAL AREA(ACRES) =						3857.1

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11310.00 TO NODE 11320.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 1299.17 DOWNSTREAM(FEET) = 1222.10  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1694.05 CHANNEL SLOPE = 0.0455  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 9.85  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.131  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	83.22	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4754.03  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.28  
 AVERAGE FLOW DEPTH(FEET) = 9.84 TRAVEL TIME(MIN.) = 1.73  
 Tc(MIN.) = 23.43  
 SUBAREA AREA(ACRES) = 83.22 SUBAREA RUNOFF(CFS) = 137.12  
 EFFECTIVE AREA(ACRES) = 2690.12 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 3940.4 PEAK FLOW RATE(CFS) = 4685.47  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 9.78

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 9.78 FLOW VELOCITY(FEET/SEC.) = 16.22  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11320.00 = 25862.86 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11304.00 TO NODE 11320.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<<  
 =====

\*\* MAIN STREAM CONFLUENCE DATA \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4685.39	23.42	2.131	0.30 ( 0.30)	1.00	2689.6	11250.00
2	4685.47	23.43	2.131	0.30 ( 0.30)	1.00	2690.1	11130.00
3	4656.80	24.14	2.081	0.30 ( 0.30)	1.00	2749.8	11220.00
4	4464.90	39.77	1.541	0.30 ( 0.30)	1.00	3890.8	11111.00
5	4439.67	40.57	1.525	0.30 ( 0.30)	1.00	3932.7	11201.00
6	4412.66	40.95	1.519	0.30 ( 0.30)	1.00	3940.4	11101.00
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11320.00 =							25862.86 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	454.90	21.87	2.238	0.30 ( 0.30)	1.00	260.8	11300.00
LONGEST FLOWPATH FROM NODE 11300.00 TO NODE 11320.00 =							8728.12 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5086.00	21.87	2.238	0.30 ( 0.30)	1.00	2773.1	11300.00
2	5115.28	23.42	2.131	0.30 ( 0.30)	1.00	2950.4	11250.00
3	5115.27	23.43	2.131	0.30 ( 0.30)	1.00	2951.0	11130.00
4	5075.03	24.14	2.081	0.30 ( 0.30)	1.00	3010.7	11220.00
5	4756.22	39.77	1.541	0.30 ( 0.30)	1.00	4151.6	11111.00
6	4727.24	40.57	1.525	0.30 ( 0.30)	1.00	4193.6	11201.00
7	4698.79	40.95	1.519	0.30 ( 0.30)	1.00	4201.2	11101.00
TOTAL AREA (ACRES) =		4201.2					

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 5115.28 Tc(MIN.) = 23.419  
EFFECTIVE AREA(ACRES) = 2950.45 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 4201.2  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11320.00 = 25862.86 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11320.00 TO NODE 11340.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1222.10 DOWNSTREAM(FEET) = 1092.58  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3157.19 CHANNEL SLOPE = 0.0410  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.66  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.956  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 328.55 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5360.13  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.14  
AVERAGE FLOW DEPTH(FEET) = 10.62 TRAVEL TIME(MIN.) = 3.26  
Tc(MIN.) = 26.68  
SUBAREA AREA(ACRES) = 328.55 SUBAREA RUNOFF(CFS) = 489.65  
EFFECTIVE AREA(ACRES) = 3279.00 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 4529.8 PEAK FLOW RATE(CFS) = 5115.28  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.40  
  
END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 10.40 FLOW VELOCITY(FEET/SEC.) = 15.96  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11340.00 = 29020.05 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11320.00 TO NODE 11340.00 IS CODE = 1  
-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 26.68  
RAINFALL INTENSITY(INCH/HR) = 1.96  
AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 3279.00  
TOTAL STREAM AREA(ACRES) = 4529.77  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 5115.28

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11330.00 TO NODE 11331.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

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

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.975  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 4.762  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" - 1.69 0.30 1.000 0 7.98  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 6.79  
TOTAL AREA(ACRES) = 1.69 PEAK FLOW RATE(CFS) = 6.79

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11331.00 TO NODE 11332.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3123.64 DOWNSTREAM(FEET) = 2903.10  
CHANNEL LENGTH THRU SUBAREA(FEET) = 710.41 CHANNEL SLOPE = 0.3104  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.29  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.801  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 5.82 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.03  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.59  
AVERAGE FLOW DEPTH(FEET) = 0.27 TRAVEL TIME(MIN.) = 2.12  
Tc(MIN.) = 10.09  
SUBAREA AREA(ACRES) = 5.82 SUBAREA RUNOFF(CFS) = 18.34  
EFFECTIVE AREA(ACRES) = 7.51 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 7.5 PEAK FLOW RATE (CFS) = 23.67  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.35

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.35 FLOW VELOCITY (FEET/SEC.) = 6.39  
LONGEST FLOWPATH FROM NODE 11330.00 TO NODE 11332.00 = 1010.24 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11332.00 TO NODE 11333.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2903.10 DOWNSTREAM (FEET) = 2718.89  
CHANNEL LENGTH THRU SUBAREA (FEET) = 843.93 CHANNEL SLOPE = 0.2183  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.51  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 3.404  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	9.66	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 37.18  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.78  
AVERAGE FLOW DEPTH (FEET) = 0.50 TRAVEL TIME (MIN.) = 2.08  
Tc (MIN.) = 12.17

SUBAREA AREA (ACRES) = 9.66 SUBAREA RUNOFF (CFS) = 26.99  
EFFECTIVE AREA (ACRES) = 17.17 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 17.2 PEAK FLOW RATE (CFS) = 47.97  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.58

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.58 FLOW VELOCITY (FEET/SEC.) = 7.45  
LONGEST FLOWPATH FROM NODE 11330.00 TO NODE 11333.00 = 1854.17 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11333.00 TO NODE 11334.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2718.89 DOWNSTREAM (FEET) = 2364.84  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1084.60 CHANNEL SLOPE = 0.3264  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.61  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 3.031  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	9.66	0.30	1.000	-

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 11.67 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 62.33  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.28  
AVERAGE FLOW DEPTH (FEET) = 0.60 TRAVEL TIME (MIN.) = 1.95  
Tc (MIN.) = 14.12  
SUBAREA AREA (ACRES) = 11.67 SUBAREA RUNOFF (CFS) = 28.69  
EFFECTIVE AREA (ACRES) = 28.84 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 28.8 PEAK FLOW RATE (CFS) = 70.90  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.65

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.65 FLOW VELOCITY (FEET/SEC.) = 9.73  
LONGEST FLOWPATH FROM NODE 11330.00 TO NODE 11334.00 = 2938.77 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11334.00 TO NODE 11335.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2364.84 DOWNSTREAM (FEET) = 1729.46  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1963.08 CHANNEL SLOPE = 0.3237  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.17  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.705  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	102.74	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 182.41  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 13.24  
AVERAGE FLOW DEPTH (FEET) = 1.12 TRAVEL TIME (MIN.) = 2.47  
Tc (MIN.) = 16.59

SUBAREA AREA (ACRES) = 102.74 SUBAREA RUNOFF (CFS) = 222.39  
EFFECTIVE AREA (ACRES) = 131.58 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 131.6 PEAK FLOW RATE (CFS) = 284.82  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.44

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.44 FLOW VELOCITY (FEET/SEC.) = 15.29  
LONGEST FLOWPATH FROM NODE 11330.00 TO NODE 11335.00 = 4901.85 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11335.00 TO NODE 11340.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1729.46 DOWNSTREAM(FEET) = 1092.58  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2702.07 CHANNEL SLOPE = 0.2357  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.86  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.405  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	90.38	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 370.56  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.86  
AVERAGE FLOW DEPTH(FEET) = 1.83 TRAVEL TIME(MIN.) = 3.03  
Tc(MIN.) = 19.62  
SUBAREA AREA(ACRES) = 90.38 SUBAREA RUNOFF(CFS) = 171.24  
EFFECTIVE AREA(ACRES) = 221.96 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 222.0 PEAK FLOW RATE(CFS) = 420.53  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.96

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.96 FLOW VELOCITY(FEET/SEC.) = 15.43  
LONGEST FLOWPATH FROM NODE 11330.00 TO NODE 11340.00 = 7603.92 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11335.00 TO NODE 11340.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION(MIN.) = 19.62  
RAINFALL INTENSITY(INCH/HR) = 2.41  
AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 221.96  
TOTAL STREAM AREA(ACRES) = 221.96  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 420.53

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5086.00	25.14	2.017	0.30( 0.30)	1.00	3101.6	11300.00
1	5115.28	26.68	1.956	0.30( 0.30)	1.00	3279.0	11250.00
1	5115.27	26.68	1.956	0.30( 0.30)	1.00	3279.5	11130.00
1	5075.03	27.40	1.927	0.30( 0.30)	1.00	3339.2	11220.00
1	4776.43	43.09	1.485	0.30( 0.30)	1.00	4480.2	11111.00
1	4768.06	43.91	1.471	0.30( 0.30)	1.00	4522.1	11201.00
1	4750.97	44.29	1.465	0.30( 0.30)	1.00	4529.8	11101.00
2	420.53	19.62	2.405	0.30( 0.30)	1.00	222.0	11330.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5287.39	19.62	2.405	0.30( 0.30)	1.00	2642.2	11330.00
2	5428.92	25.14	2.017	0.30( 0.30)	1.00	3323.6	11300.00
3	5446.07	26.68	1.956	0.30( 0.30)	1.00	3501.0	11250.00
4	5446.02	26.68	1.956	0.30( 0.30)	1.00	3501.5	11130.00
5	5400.11	27.40	1.927	0.30( 0.30)	1.00	3561.2	11220.00
6	5013.06	43.09	1.485	0.30( 0.30)	1.00	4702.2	11111.00
7	5002.09	43.91	1.471	0.30( 0.30)	1.00	4744.1	11201.00
8	4983.76	44.29	1.465	0.30( 0.30)	1.00	4751.7	11101.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 5446.07 Tc(MIN.) = 26.68  
EFFECTIVE AREA(ACRES) = 3500.96 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 4751.7  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11340.00 = 29020.05 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11340.00 TO NODE 11341.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1092.58 DOWNSTREAM(FEET) = 1055.49  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1432.69 CHANNEL SLOPE = 0.0259  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.88  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.887  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	54.55	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5485.03  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.67  
AVERAGE FLOW DEPTH(FEET) = 11.88 TRAVEL TIME(MIN.) = 1.75  
Tc(MIN.) = 28.43  
SUBAREA AREA(ACRES) = 54.55 SUBAREA RUNOFF(CFS) = 77.92  
EFFECTIVE AREA(ACRES) = 3555.51 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 4806.3 PEAK FLOW RATE(CFS) = 5446.07  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.85

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 11.85 FLOW VELOCITY(FEET/SEC.) = 13.65  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11341.00 = 30452.74 FEET.

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*****
FLOW PROCESS FROM NODE 11341.00 TO NODE 11342.00 IS CODE = 56
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1055.49 DOWNSTREAM(FEET) = 1017.16
CHANNEL LENGTH THRU SUBAREA(FEET) = 943.89 CHANNEL SLOPE = 0.0406
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 10.81
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.849
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
LAND USE           GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED      -      119.96   0.30   1.000   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5529.68
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.21
AVERAGE FLOW DEPTH(FEET) = 10.80 TRAVEL TIME(MIN.) = 0.97
Tc(MIN.) = 29.40
SUBAREA AREA(ACRES) = 119.96 SUBAREA RUNOFF(CFS) = 167.22
EFFECTIVE AREA(ACRES) = 3675.47 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 4926.2 PEAK FLOW RATE(CFS) = 5446.07
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 10.72

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 10.72 FLOW VELOCITY(FEET/SEC.) = 16.15
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11342.00 = 31396.63 FEET.

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*****
FLOW PROCESS FROM NODE 11342.00 TO NODE 11360.00 IS CODE = 56
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1017.16 DOWNSTREAM(FEET) = 957.53
CHANNEL LENGTH THRU SUBAREA(FEET) = 1557.63 CHANNEL SLOPE = 0.0383
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 10.92
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.795
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
LAND USE           GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED      -      85.25   0.30   0.990   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.990
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5503.54
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.84
AVERAGE FLOW DEPTH(FEET) = 10.91 TRAVEL TIME(MIN.) = 1.64
Tc(MIN.) = 31.03
SUBAREA AREA(ACRES) = 85.25 SUBAREA RUNOFF(CFS) = 114.93

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EFFECTIVE AREA(ACRES) = 3760.72 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 5011.5 PEAK FLOW RATE(CFS) = 5446.07
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 10.87

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 10.87 FLOW VELOCITY(FEET/SEC.) = 15.79
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11360.00 = 32954.26 FEET.

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*****
FLOW PROCESS FROM NODE 11342.00 TO NODE 11360.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 31.03
RAINFALL INTENSITY(INCH/HR) = 1.79
AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 3760.72
TOTAL STREAM AREA(ACRES) = 5011.49
PEAK FLOW RATE(CFS) AT CONFLUENCE = 5446.07

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

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 14.655
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.928
SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS   Tc
LAND USE           GROUP   (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"CHAPARRAL,NARROWLEAF" -      5.40   0.30   1.000   0   14.66
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 12.77
TOTAL AREA(ACRES) = 5.40 PEAK FLOW RATE(CFS) = 12.77

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*****
FLOW PROCESS FROM NODE 11351.00 TO NODE 11352.00 IS CODE = 56
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 2583.16 DOWNSTREAM(FEET) = 2403.73
CHANNEL LENGTH THRU SUBAREA(FEET) = 956.57 CHANNEL SLOPE = 0.1876

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GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.47  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.628  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	15.56	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 29.13  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.90  
 AVERAGE FLOW DEPTH (FEET) = 0.45 TRAVEL TIME (MIN.) = 2.70  
 Tc (MIN.) = 17.36  
 SUBAREA AREA (ACRES) = 15.56 SUBAREA RUNOFF (CFS) = 32.61  
 EFFECTIVE AREA (ACRES) = 20.96 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 21.0 PEAK FLOW RATE (CFS) = 43.92  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.58

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.58 FLOW VELOCITY (FEET/SEC.) = 6.85  
 LONGEST FLOWPATH FROM NODE 11350.00 TO NODE 11352.00 = 1907.11 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11352.00 TO NODE 11353.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2403.73 DOWNSTREAM (FEET) = 1786.74  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1933.85 CHANNEL SLOPE = 0.3190  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.89  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.352  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	74.05	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 112.48  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.29  
 AVERAGE FLOW DEPTH (FEET) = 0.85 TRAVEL TIME (MIN.) = 2.86  
 Tc (MIN.) = 20.22  
 SUBAREA AREA (ACRES) = 74.05 SUBAREA RUNOFF (CFS) = 136.77  
 EFFECTIVE AREA (ACRES) = 95.01 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 95.0 PEAK FLOW RATE (CFS) = 175.48  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.10

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.10 FLOW VELOCITY (FEET/SEC.) = 13.06

LONGEST FLOWPATH FROM NODE 11350.00 TO NODE 11353.00 = 3840.96 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11353.00 TO NODE 11354.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1786.74 DOWNSTREAM (FEET) = 1308.39  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2073.35 CHANNEL SLOPE = 0.2307  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.35  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.160  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	41.22	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 209.99  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.38  
 AVERAGE FLOW DEPTH (FEET) = 1.34 TRAVEL TIME (MIN.) = 2.79  
 Tc (MIN.) = 23.01  
 SUBAREA AREA (ACRES) = 41.22 SUBAREA RUNOFF (CFS) = 68.99  
 EFFECTIVE AREA (ACRES) = 136.23 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 136.2 PEAK FLOW RATE (CFS) = 228.00  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.40

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.40 FLOW VELOCITY (FEET/SEC.) = 12.71  
 LONGEST FLOWPATH FROM NODE 11350.00 TO NODE 11354.00 = 5914.31 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11354.00 TO NODE 11360.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1308.39 DOWNSTREAM (FEET) = 957.53  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2455.49 CHANNEL SLOPE = 0.1429  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.18  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.972  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	201.53	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 379.78  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.55  
 AVERAGE FLOW DEPTH (FEET) = 2.12 TRAVEL TIME (MIN.) = 3.26  
 Tc (MIN.) = 26.27

SUBAREA AREA (ACRES) = 201.53 SUBAREA RUNOFF (CFS) = 303.29  
 EFFECTIVE AREA (ACRES) = 337.76 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 337.8 PEAK FLOW RATE (CFS) = 508.30  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.48

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.48 FLOW VELOCITY (FEET/SEC.) = 13.67  
 LONGEST FLOWPATH FROM NODE 11350.00 TO NODE 11360.00 = 8369.80 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11354.00 TO NODE 11360.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION (MIN.) = 26.27  
 RAINFALL INTENSITY (INCH/HR) = 1.97  
 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA (ACRES) = 337.76  
 TOTAL STREAM AREA (ACRES) = 337.76  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 508.30

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5287.39	24.00	2.091	0.30 ( 0.30)	1.00	2902.0	11330.00
1	5428.92	29.50	1.845	0.30 ( 0.30)	1.00	3583.3	11300.00
1	5446.07	31.03	1.795	0.30 ( 0.30)	1.00	3760.7	11250.00
1	5446.02	31.04	1.795	0.30 ( 0.30)	1.00	3761.2	11130.00
1	5400.11	31.77	1.773	0.30 ( 0.30)	1.00	3820.9	11220.00
1	5013.06	47.54	1.413	0.30 ( 0.30)	1.00	4961.9	11111.00
1	5002.09	48.36	1.400	0.30 ( 0.30)	1.00	5003.8	11201.00
1	4983.76	48.75	1.394	0.30 ( 0.30)	1.00	5011.5	11101.00
2	508.30	26.27	1.972	0.30 ( 0.30)	1.00	337.8	11350.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5784.85	24.00	2.091	0.30 ( 0.30)	1.00	3210.6	11330.00
2	5854.04	26.27	1.972	0.30 ( 0.30)	1.00	3520.6	11350.00
3	5898.54	29.50	1.845	0.30 ( 0.30)	1.00	3921.1	11300.00
4	5900.51	31.03	1.795	0.30 ( 0.30)	1.00	4098.5	11250.00
5	5900.41	31.04	1.795	0.30 ( 0.30)	1.00	4099.0	11130.00
6	5848.05	31.77	1.773	0.30 ( 0.30)	1.00	4158.7	11220.00
7	5351.51	47.54	1.413	0.30 ( 0.30)	1.00	5299.7	11111.00
8	5336.56	48.36	1.400	0.30 ( 0.30)	1.00	5341.6	11201.00
9	5316.34	48.75	1.394	0.30 ( 0.30)	1.00	5349.2	11101.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE (CFS) = 5900.51 Tc (MIN.) = 31.03  
 EFFECTIVE AREA (ACRES) = 4098.48 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 5349.2  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11360.00 = 32954.26 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11360.00 TO NODE 11361.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 957.53 DOWNSTREAM (FEET) = 847.62  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2937.03 CHANNEL SLOPE = 0.0374  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 11.42  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.706  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	176.74	0.30	0.977	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.977  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 6012.91  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 16.06  
 AVERAGE FLOW DEPTH (FEET) = 11.41 TRAVEL TIME (MIN.) = 3.05  
 Tc (MIN.) = 34.08

SUBAREA AREA (ACRES) = 176.74 SUBAREA RUNOFF (CFS) = 224.79  
 EFFECTIVE AREA (ACRES) = 4275.22 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 5526.0 PEAK FLOW RATE (CFS) = 5900.51  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 11.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 11.32 FLOW VELOCITY (FEET/SEC.) = 15.98  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11361.00 = 35891.29 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11361.00 TO NODE 11362.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 847.62 DOWNSTREAM (FEET) = 738.28  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 3869.90 CHANNEL SLOPE = 0.0283  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 12.30  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.577  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	429.50	0.30	0.995	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.995  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6147.70  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.53  
 AVERAGE FLOW DEPTH(FEET) = 12.26 TRAVEL TIME(MIN.) = 4.44  
 Tc(MIN.) = 38.52  
 SUBAREA AREA(ACRES) = 429.50 SUBAREA RUNOFF(CFS) = 494.25  
 EFFECTIVE AREA(ACRES) = 4704.72 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 5955.5 PEAK FLOW RATE(CFS) = 5900.51  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 12.04

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 12.04 FLOW VELOCITY(FEET/SEC.) = 14.39  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11362.00 = 39761.19 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11362.00 TO NODE 11363.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 738.28 DOWNSTREAM(FEET) = 678.93  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2987.23 CHANNEL SLOPE = 0.0199  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 13.07  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.495

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	125.97	0.30	0.991	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.991  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5968.39  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.64  
 AVERAGE FLOW DEPTH(FEET) = 13.06 TRAVEL TIME(MIN.) = 3.94  
 Tc(MIN.) = 42.46  
 SUBAREA AREA(ACRES) = 125.97 SUBAREA RUNOFF(CFS) = 135.76  
 EFFECTIVE AREA(ACRES) = 4830.69 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 6081.5 PEAK FLOW RATE(CFS) = 5900.51  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 13.00

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 13.00 FLOW VELOCITY(FEET/SEC.) = 12.61  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11363.00 = 42748.42 FEET.

=====

END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 6081.5 TC(MIN.) = 42.46  
 EFFECTIVE AREA(ACRES) = 4830.69 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.998

PEAK FLOW RATE(CFS) = 5900.51

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5784.85	35.47	1.666	0.30( 0.30)	1.00	3942.8	11330.00
2	5854.04	37.70	1.601	0.30( 0.30)	1.00	4252.8	11350.00
3	5898.54	40.91	1.519	0.30( 0.30)	1.00	4653.3	11300.00
4	5900.51	42.46	1.495	0.30( 0.30)	1.00	4830.7	11250.00
5	5900.41	42.46	1.495	0.30( 0.30)	1.00	4831.2	11130.00
6	5848.05	43.22	1.483	0.30( 0.30)	1.00	4890.9	11220.00
7	5505.59	59.23	1.306	0.30( 0.30)	1.00	6031.9	11111.00
8	5511.87	60.05	1.300	0.30( 0.30)	1.00	6073.8	11201.00
9	5503.29	60.45	1.297	0.30( 0.30)	1.00	6081.5	11101.00

=====

END OF RATIONAL METHOD ANALYSIS



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

Analysis prepared by:

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FILE NAME: S14.DAT  
TIME/DATE OF STUDY: 10:07 04/01/2013  
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--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.076
- 2) 10.00; 3.785
- 3) 15.00; 2.842
- 4) 20.00; 2.353
- 5) 25.00; 2.012
- 6) 30.00; 1.815
- 7) 40.00; 1.527
- 8) 50.00; 1.366
- 9) 60.00; 1.290
- 10) 90.00; 1.083
- 11) 120.00; 0.953
- 12) 180.00; 0.842
- 13) 360.00; 0.642
- 14) 1440.00; 0.288

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11401.00 TO NODE 11401.50 IS CODE = 21  
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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 313.41  
ELEVATION DATA: UPSTREAM(FEET) = 3384.11 DOWNSTREAM(FEET) = 3232.76

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.137  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 4.639  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 2.25 0.30 1.000 0 8.14  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 8.79  
TOTAL AREA (ACRES) = 2.25 PEAK FLOW RATE (CFS) = 8.79

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11401.50 TO NODE 11402.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3232.76 DOWNSTREAM(FEET) = 3001.05  
CHANNEL LENGTH THRU SUBAREA(FEET) = 620.75 CHANNEL SLOPE = 0.3733  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.38  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.988  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN  
USER-DEFINED - 11.39 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 27.78  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.29  
AVERAGE FLOW DEPTH(FEET) = 0.36 TRAVEL TIME(MIN.) = 1.42  
Tc(MIN.) = 9.56  
SUBAREA AREA(ACRES) = 11.39 SUBAREA RUNOFF(CFS) = 37.81  
EFFECTIVE AREA(ACRES) = 13.64 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 13.6 PEAK FLOW RATE(CFS) = 45.28  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.48

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.48 FLOW VELOCITY(FEET/SEC.) = 8.65  
LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11402.00 = 934.16 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11402.00 TO NODE 11403.00 IS CODE = 56  
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-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3001.05 DOWNSTREAM(FEET) = 2787.96  
CHANNEL LENGTH THRU SUBAREA(FEET) = 962.99 CHANNEL SLOPE = 0.2213  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.83

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.534

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	26.43	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 83.82

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.06

AVERAGE FLOW DEPTH(FEET) = 0.80 TRAVEL TIME(MIN.) = 1.77

Tc(MIN.) = 11.33

SUBAREA AREA(ACRES) = 26.43 SUBAREA RUNOFF(CFS) = 76.94

EFFECTIVE AREA(ACRES) = 40.07 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 40.1 PEAK FLOW RATE(CFS) = 116.65

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.97

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.97 FLOW VELOCITY(FEET/SEC.) = 10.12

LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11403.00 = 1897.15 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11403.00 TO NODE 11404.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2787.96 DOWNSTREAM(FEET) = 2518.71  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1956.80 CHANNEL SLOPE = 0.1376  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.57

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.931

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	67.85	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 197.43

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.19

AVERAGE FLOW DEPTH(FEET) = 1.49 TRAVEL TIME(MIN.) = 3.20

Tc(MIN.) = 14.53

SUBAREA AREA(ACRES) = 67.85 SUBAREA RUNOFF(CFS) = 160.65

EFFECTIVE AREA(ACRES) = 107.92 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 107.9 PEAK FLOW RATE(CFS) = 255.52

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.73

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.73 FLOW VELOCITY(FEET/SEC.) = 11.00

LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11404.00 = 3853.95 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11404.00 TO NODE 11405.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2518.71 DOWNSTREAM(FEET) = 2304.57  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1944.99 CHANNEL SLOPE = 0.1101  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.18

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.602

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	80.61	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 339.11

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.09

AVERAGE FLOW DEPTH(FEET) = 2.14 TRAVEL TIME(MIN.) = 2.92

Tc(MIN.) = 17.45

SUBAREA AREA(ACRES) = 80.61 SUBAREA RUNOFF(CFS) = 167.02

EFFECTIVE AREA(ACRES) = 188.53 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 188.5 PEAK FLOW RATE(CFS) = 390.63

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.31

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.31 FLOW VELOCITY(FEET/SEC.) = 11.54

LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11405.00 = 5798.94 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11405.00 TO NODE 11406.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2304.57 DOWNSTREAM(FEET) = 1888.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3280.59 CHANNEL SLOPE = 0.1270  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.56

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.239

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	111.04	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 487.64  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.95  
 AVERAGE FLOW DEPTH(FEET) = 2.51 TRAVEL TIME(MIN.) = 4.22  
 Tc(MIN.) = 21.67  
 SUBAREA AREA(ACRES) = 111.04 SUBAREA RUNOFF(CFS) = 193.77  
 EFFECTIVE AREA(ACRES) = 299.57 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 299.6 PEAK FLOW RATE(CFS) = 522.76  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.60

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.60 FLOW VELOCITY(FEET/SEC.) = 13.20  
 LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11406.00 = 9079.53 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11406.00 TO NODE 11407.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1888.00 DOWNSTREAM(FEET) = 1539.46  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2842.33 CHANNEL SLOPE = 0.1226  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.94  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.007

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	141.19	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 631.29  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.75  
 AVERAGE FLOW DEPTH(FEET) = 2.90 TRAVEL TIME(MIN.) = 3.44  
 Tc(MIN.) = 25.12  
 SUBAREA AREA(ACRES) = 141.19 SUBAREA RUNOFF(CFS) = 216.96  
 EFFECTIVE AREA(ACRES) = 440.76 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 440.8 PEAK FLOW RATE(CFS) = 677.30  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.01

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.01 FLOW VELOCITY(FEET/SEC.) = 14.04  
 LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11407.00 = 11921.86 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11407.00 TO NODE 11408.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1539.46 DOWNSTREAM(FEET) = 1268.36  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2859.01 CHANNEL SLOPE = 0.0948  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.51  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.867

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	158.63	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 789.17  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.35  
 AVERAGE FLOW DEPTH(FEET) = 3.48 TRAVEL TIME(MIN.) = 3.57  
 Tc(MIN.) = 28.69  
 SUBAREA AREA(ACRES) = 158.63 SUBAREA RUNOFF(CFS) = 223.68  
 EFFECTIVE AREA(ACRES) = 599.39 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 599.4 PEAK FLOW RATE(CFS) = 845.20  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.61

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.61 FLOW VELOCITY(FEET/SEC.) = 13.59  
 LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11408.00 = 14780.87 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11408.00 TO NODE 11409.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1268.36 DOWNSTREAM(FEET) = 1109.80  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2883.36 CHANNEL SLOPE = 0.0550  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.49  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.733

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	208.66	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 979.85  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.59  
 AVERAGE FLOW DEPTH(FEET) = 4.47 TRAVEL TIME(MIN.) = 4.15  
 Tc(MIN.) = 32.83  
 SUBAREA AREA(ACRES) = 208.66 SUBAREA RUNOFF(CFS) = 269.19  
 EFFECTIVE AREA(ACRES) = 808.05 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 808.1 PEAK FLOW RATE(CFS) = 1042.46  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.60

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 4.60 FLOW VELOCITY(FEET/SEC.) = 11.79  
LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11409.00 = 17664.23 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11409.00 TO NODE 11409.50 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1109.80 DOWNSTREAM(FEET) = 953.45  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2734.25 CHANNEL SLOPE = 0.0572  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.69  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.625

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	97.66	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1100.71  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.14  
AVERAGE FLOW DEPTH(FEET) = 4.68 TRAVEL TIME(MIN.) = 3.75  
Tc(MIN.) = 36.59

SUBAREA AREA(ACRES) = 97.66 SUBAREA RUNOFF(CFS) = 116.49  
EFFECTIVE AREA(ACRES) = 905.71 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 905.7 PEAK FLOW RATE(CFS) = 1080.35  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.64

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 4.64 FLOW VELOCITY(FEET/SEC.) = 12.07  
LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11409.50 = 20398.48 FEET.

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FLOW PROCESS FROM NODE 11409.50 TO NODE 11410.00 IS CODE = 56

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 953.45 DOWNSTREAM(FEET) = 914.20  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1100.66 CHANNEL SLOPE = 0.0357  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.39  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.574

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	130.64	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1155.26  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.33

AVERAGE FLOW DEPTH(FEET) = 5.38 TRAVEL TIME(MIN.) = 1.78  
Tc(MIN.) = 38.36  
SUBAREA AREA(ACRES) = 130.64 SUBAREA RUNOFF(CFS) = 149.82  
EFFECTIVE AREA(ACRES) = 1036.35 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1036.4 PEAK FLOW RATE(CFS) = 1188.49  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.46

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 5.46 FLOW VELOCITY(FEET/SEC.) = 10.41  
LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11410.00 = 21499.14 FEET.

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FLOW PROCESS FROM NODE 11410.00 TO NODE 11411.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 914.20 DOWNSTREAM(FEET) = 740.43  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3015.96 CHANNEL SLOPE = 0.0576  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.19  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.490

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	299.66	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1349.02  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.84  
AVERAGE FLOW DEPTH(FEET) = 5.17 TRAVEL TIME(MIN.) = 3.92  
Tc(MIN.) = 42.28

SUBAREA AREA(ACRES) = 299.66 SUBAREA RUNOFF(CFS) = 321.04  
EFFECTIVE AREA(ACRES) = 1336.01 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1336.0 PEAK FLOW RATE(CFS) = 1431.33  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 5.32 FLOW VELOCITY(FEET/SEC.) = 13.03  
LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11411.00 = 24515.10 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11411.00 TO NODE 11431.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 740.43 DOWNSTREAM(FEET) = 651.70  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1605.97 CHANNEL SLOPE = 0.0553  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.44  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.457  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 70.41 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1467.99  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.94  
 AVERAGE FLOW DEPTH (FEET) = 5.44 TRAVEL TIME (MIN.) = 2.07  
 Tc (MIN.) = 44.35  
 SUBAREA AREA (ACRES) = 70.41 SUBAREA RUNOFF (CFS) = 73.32  
 EFFECTIVE AREA (ACRES) = 1406.42 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 1406.4 PEAK FLOW RATE (CFS) = 1464.59  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 5.43

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 5.43 FLOW VELOCITY (FEET/SEC.) = 12.91  
 LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11431.00 = 26121.07 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11411.00 TO NODE 11431.00 IS CODE = 10  
 -----  
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<<  
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 FLOW PROCESS FROM NODE 11023.00 TO NODE 11363.00 IS CODE = 15.1  
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 >>>>DEFINE MEMORY BANK # 2 <<<<<<  
 =====

PEAK FLOWRATE TABLE FILE NAME: S10.DNA  
 MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11874.63	24.58	0.30 ( 0.30)	1.00	4274.9	11000.00
2	13555.94	36.97	0.30 ( 0.30)	1.00	7319.0	10850.00
3	13652.81	37.84	0.30 ( 0.30)	1.00	7539.3	10800.00
4	13867.44	39.66	0.30 ( 0.30)	1.00	8077.3	10900.00
5	14120.57	42.76	0.30 ( 0.30)	1.00	8902.7	10830.00
6	14121.94	42.79	0.30 ( 0.30)	1.00	8909.8	10910.00
7	14127.90	43.78	0.30 ( 0.30)	1.00	9113.5	10630.00
8	14090.30	54.74	0.30 ( 0.30)	1.00	11511.9	10600.00
9	14228.13	61.37	0.30 ( 0.30)	1.00	12987.2	10500.00
10	14319.75	65.59	0.30 ( 0.30)	1.00	13870.6	10710.00
11	14315.66	67.53	0.30 ( 0.30)	1.00	14202.7	10410.00
12	14143.87	72.01	0.30 ( 0.30)	1.00	14863.7	10700.00
13	13902.44	78.72	0.30 ( 0.30)	1.00	15782.8	10400.00
14	13870.86	80.96	0.30 ( 0.30)	1.00	16052.6	10200.00
15	13650.44	86.64	0.30 ( 0.30)	1.00	16631.8	10300.00
16	13640.51	86.83	0.30 ( 0.30)	1.00	16644.6	10320.00
17	13314.82	91.42	0.30 ( 0.30)	1.00	16836.5	10210.00
18	11879.54	117.21	0.30 ( 0.30)	1.00	17533.1	10100.00
TOTAL AREA (ACRES) =						17533.1

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11362.00 TO NODE 11363.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<<  
 =====

PEAK FLOWRATE TABLE FILE NAME: S13.DNA  
 MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5784.85	35.47	0.30 ( 0.30)	1.00	3942.8	11330.00
2	5854.04	37.70	0.30 ( 0.30)	1.00	4252.8	11350.00
3	5898.54	40.91	0.30 ( 0.30)	1.00	4653.3	11300.00
4	5900.51	42.46	0.30 ( 0.30)	1.00	4830.7	11250.00
5	5900.41	42.46	0.30 ( 0.30)	1.00	4831.2	11130.00
6	5848.05	43.22	0.30 ( 0.30)	1.00	4890.9	11220.00
7	5505.59	59.23	0.30 ( 0.30)	1.00	6031.9	11111.00
8	5511.87	60.05	0.30 ( 0.30)	1.00	6073.8	11201.00
9	5503.29	60.45	0.30 ( 0.30)	1.00	6081.5	11101.00
TOTAL AREA (ACRES) =						6081.5

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11362.00 TO NODE 11363.00 IS CODE = 14.0  
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>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
 =====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5784.85	35.47	0.30 ( 0.30)	1.00	3942.8	11330.00
2	5854.04	37.70	0.30 ( 0.30)	1.00	4252.8	11350.00
3	5898.54	40.91	0.30 ( 0.30)	1.00	4653.3	11300.00
4	5900.51	42.46	0.30 ( 0.30)	1.00	4830.7	11250.00
5	5900.41	42.46	0.30 ( 0.30)	1.00	4831.2	11130.00
6	5848.05	43.22	0.30 ( 0.30)	1.00	4890.9	11220.00
7	5505.59	59.23	0.30 ( 0.30)	1.00	6031.9	11111.00
8	5511.87	60.05	0.30 ( 0.30)	1.00	6073.8	11201.00
9	5503.29	60.45	0.30 ( 0.30)	1.00	6081.5	11101.00
TOTAL AREA (ACRES) =						6081.5

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11023.00 TO NODE 11363.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5784.85	35.47	1.658	0.30 ( 0.30)	1.00	3942.8	11330.00
2	5854.04	37.70	1.593	0.30 ( 0.30)	1.00	4252.8	11350.00
3	5898.54	40.91	1.512	0.30 ( 0.30)	1.00	4653.3	11300.00
4	5900.51	42.46	1.487	0.30 ( 0.30)	1.00	4830.7	11250.00
5	5900.41	42.46	1.487	0.30 ( 0.30)	1.00	4831.2	11130.00
6	5848.05	43.22	1.475	0.30 ( 0.30)	1.00	4890.9	11220.00
7	5505.59	59.23	1.296	0.30 ( 0.30)	1.00	6031.9	11111.00
8	5511.87	60.05	1.290	0.30 ( 0.30)	1.00	6073.8	11201.00

9 5503.29 60.45 1.287 0.30( 0.30) 1.00 6081.5 11101.00  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11363.00 = 42748.42 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11874.63	24.58	2.041	0.30( 0.30)	1.00	4274.9	11000.00
2	13555.94	36.97	1.614	0.30( 0.30)	1.00	7319.0	10850.00
3	13652.81	37.84	1.589	0.30( 0.30)	1.00	7539.3	10800.00
4	13867.44	39.66	1.537	0.30( 0.30)	1.00	8077.3	10900.00
5	14120.57	42.76	1.483	0.30( 0.30)	1.00	8902.7	10830.00
6	14121.94	42.79	1.482	0.30( 0.30)	1.00	8909.8	10910.00
7	14127.90	43.78	1.466	0.30( 0.30)	1.00	9113.5	10630.00
8	14090.30	54.74	1.330	0.30( 0.30)	1.00	11511.9	10600.00
9	14228.13	61.37	1.281	0.30( 0.30)	1.00	12987.2	10500.00
10	14319.75	65.59	1.251	0.30( 0.30)	1.00	13870.6	10710.00
11	14315.66	67.53	1.238	0.30( 0.30)	1.00	14202.7	10410.00
12	14143.87	72.01	1.207	0.30( 0.30)	1.00	14863.7	10700.00
13	13902.44	78.72	1.161	0.30( 0.30)	1.00	15782.8	10400.00
14	13870.86	80.96	1.145	0.30( 0.30)	1.00	16052.6	10200.00
15	13650.44	86.64	1.106	0.30( 0.30)	1.00	16631.8	10300.00
16	13640.51	86.83	1.105	0.30( 0.30)	1.00	16644.6	10320.00
17	13314.82	91.42	1.077	0.30( 0.30)	1.00	16836.5	10210.00
18	11879.54	117.21	0.965	0.30( 0.30)	1.00	17533.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11363.00 = 69154.02 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	17014.57	24.58	2.041	0.30( 0.30)	1.00	7007.1	11000.00
2	19137.05	35.47	1.658	0.30( 0.30)	1.00	10892.9	11330.00
3	19387.28	36.97	1.614	0.30( 0.30)	1.00	11470.1	10850.00
4	19490.87	37.70	1.593	0.30( 0.30)	1.00	11755.8	11350.00
5	19508.86	37.84	1.589	0.30( 0.30)	1.00	11810.2	10800.00
6	19748.57	39.66	1.537	0.30( 0.30)	1.00	12573.9	10900.00
7	19868.51	40.91	1.512	0.30( 0.30)	1.00	13065.0	11300.00
8	19996.32	42.46	1.487	0.30( 0.30)	1.00	13652.7	11250.00
9	19996.70	42.46	1.487	0.30( 0.30)	1.00	13654.8	11130.00
10	20000.26	42.76	1.483	0.30( 0.30)	1.00	13757.6	10830.00
11	19999.60	42.79	1.482	0.30( 0.30)	1.00	13767.0	10910.00
12	19972.54	43.22	1.475	0.30( 0.30)	1.00	13887.9	11220.00
13	19963.79	43.78	1.466	0.30( 0.30)	1.00	14044.9	10630.00
14	19691.88	54.74	1.330	0.30( 0.30)	1.00	17224.0	10600.00
15	19689.18	59.23	1.296	0.30( 0.30)	1.00	18542.3	11111.00
16	19712.66	60.05	1.290	0.30( 0.30)	1.00	18768.3	11201.00
17	19712.34	60.45	1.287	0.30( 0.30)	1.00	18864.4	11101.00
18	19696.12	61.37	1.281	0.30( 0.30)	1.00	19068.7	10500.00
19	19625.43	65.59	1.251	0.30( 0.30)	1.00	19952.0	10710.00
20	19546.90	67.53	1.238	0.30( 0.30)	1.00	20284.1	10410.00
21	19202.49	72.01	1.207	0.30( 0.30)	1.00	20945.1	10700.00
22	18703.19	78.72	1.161	0.30( 0.30)	1.00	21864.2	10400.00
23	18585.36	80.96	1.145	0.30( 0.30)	1.00	22134.0	10200.00
24	18146.41	86.64	1.106	0.30( 0.30)	1.00	22713.3	10300.00
25	18129.31	86.83	1.105	0.30( 0.30)	1.00	22726.0	10320.00
26	17647.50	91.42	1.077	0.30( 0.30)	1.00	22917.9	10210.00
27	15589.13	117.21	0.965	0.30( 0.30)	1.00	23614.5	10100.00

TOTAL AREA (ACRES) = 23614.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 20000.26 Tc(MIN.) = 42.761  
 EFFECTIVE AREA(ACRES) = 13757.55 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 23614.5  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11363.00 = 69154.02 FEET.

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FLOW PROCESS FROM NODE 11363.00 TO NODE 11431.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 678.93 DOWNSTREAM(FEET) = 651.70  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2069.94 CHANNEL SLOPE = 0.0132  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 16.39  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.447

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	165.16	0.30	0.997	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.997

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20085.56

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.50

AVERAGE FLOW DEPTH(FEET) = 16.38 TRAVEL TIME(MIN.) = 2.23

Tc(MIN.) = 44.99

SUBAREA AREA(ACRES) = 165.16 SUBAREA RUNOFF(CFS) = 170.60

EFFECTIVE AREA(ACRES) = 13922.71 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 23779.7 PEAK FLOW RATE(CFS) = 20000.26

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050

\*ESTIMATED CHANNEL HEIGHT(FEET) = 16.34

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 16.34 FLOW VELOCITY(FEET/SEC.) = 15.49

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

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FLOW PROCESS FROM NODE 11411.00 TO NODE 11431.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	17014.57	26.89	1.937	0.30( 0.30)	1.00	7172.3	11000.00
2	19137.05	37.71	1.593	0.30( 0.30)	1.00	11058.1	11330.00
3	19387.28	39.21	1.550	0.30( 0.30)	1.00	11635.3	10850.00
4	19490.87	39.94	1.529	0.30( 0.30)	1.00	11921.0	11350.00
5	19508.86	40.08	1.526	0.30( 0.30)	1.00	11975.4	10800.00
6	19748.57	41.89	1.497	0.30( 0.30)	1.00	12739.1	10900.00
7	19868.51	43.14	1.476	0.30( 0.30)	1.00	13230.1	11300.00

8	19996.32	44.68	1.452	0.30	( 0.30)	1.00	13817.8	11250.00
9	19996.70	44.69	1.452	0.30	( 0.30)	1.00	13819.9	11130.00
10	20000.26	44.99	1.447	0.30	( 0.30)	1.00	13922.7	10830.00
11	19999.60	45.02	1.446	0.30	( 0.30)	1.00	13932.2	10910.00
12	19972.54	45.44	1.439	0.30	( 0.30)	1.00	14053.1	11220.00
13	19963.79	46.01	1.430	0.30	( 0.30)	1.00	14210.1	10630.00
14	19691.88	56.97	1.313	0.30	( 0.30)	1.00	17389.1	10600.00
15	19689.18	61.46	1.280	0.30	( 0.30)	1.00	18707.4	11111.00
16	19712.66	62.29	1.274	0.30	( 0.30)	1.00	18933.4	11201.00
17	19712.34	62.69	1.271	0.30	( 0.30)	1.00	19029.6	11101.00
18	19696.12	63.60	1.265	0.30	( 0.30)	1.00	19233.8	10500.00
19	19625.43	67.83	1.236	0.30	( 0.30)	1.00	20117.2	10710.00
20	19546.90	69.76	1.223	0.30	( 0.30)	1.00	20449.3	10410.00
21	19202.49	74.26	1.192	0.30	( 0.30)	1.00	21110.3	10700.00
22	18703.19	80.98	1.145	0.30	( 0.30)	1.00	22029.4	10400.00
23	18585.36	83.23	1.130	0.30	( 0.30)	1.00	22299.2	10200.00
24	18146.41	88.93	1.090	0.30	( 0.30)	1.00	22878.5	10300.00
25	18129.31	89.11	1.089	0.30	( 0.30)	1.00	22891.2	10320.00
26	17647.50	93.72	1.067	0.30	( 0.30)	1.00	23083.1	10210.00
27	15589.13	119.59	0.955	0.30	( 0.30)	1.00	23779.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1464.59	44.35	1.457	0.30 ( 0.30)	1.00	1406.4	11401.00

LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11431.00 = 26121.07 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	18271.49	26.89	1.937	0.30 ( 0.30)	1.00	8025.2	11000.00
2	20528.79	37.71	1.593	0.30 ( 0.30)	1.00	12254.2	11330.00
3	20786.00	39.21	1.550	0.30 ( 0.30)	1.00	12878.7	10850.00
4	20891.66	39.94	1.529	0.30 ( 0.30)	1.00	13187.6	11350.00
5	20911.18	40.08	1.526	0.30 ( 0.30)	1.00	13246.6	10800.00
6	21179.27	41.89	1.497	0.30 ( 0.30)	1.00	14067.5	10900.00
7	21317.19	43.14	1.476	0.30 ( 0.30)	1.00	14598.3	11300.00
8	21433.15	44.35	1.457	0.30 ( 0.30)	1.00	15096.6	11401.00
9	21454.10	44.68	1.452	0.30 ( 0.30)	1.00	15224.3	11250.00
10	21454.35	44.69	1.452	0.30 ( 0.30)	1.00	15226.4	11130.00
11	21451.83	44.99	1.447	0.30 ( 0.30)	1.00	15329.1	10830.00
12	21450.57	45.02	1.446	0.30 ( 0.30)	1.00	15338.6	10910.00
13	21414.84	45.44	1.439	0.30 ( 0.30)	1.00	15459.5	11220.00
14	21394.48	46.01	1.430	0.30 ( 0.30)	1.00	15616.5	10630.00
15	20974.20	56.97	1.313	0.30 ( 0.30)	1.00	18795.6	10600.00
16	20929.62	61.46	1.280	0.30 ( 0.30)	1.00	20113.9	11111.00
17	20945.89	62.29	1.274	0.30 ( 0.30)	1.00	20339.9	11201.00
18	20942.10	62.69	1.271	0.30 ( 0.30)	1.00	20436.0	11101.00
19	20917.86	63.60	1.265	0.30 ( 0.30)	1.00	20640.2	10500.00
20	20810.29	67.83	1.236	0.30 ( 0.30)	1.00	21523.6	10710.00
21	20714.83	69.76	1.223	0.30 ( 0.30)	1.00	21855.7	10410.00
22	20331.12	74.26	1.192	0.30 ( 0.30)	1.00	22516.7	10700.00
23	19773.12	80.98	1.145	0.30 ( 0.30)	1.00	23435.8	10400.00
24	19635.68	83.23	1.130	0.30 ( 0.30)	1.00	23705.6	10200.00
25	19146.98	88.93	1.090	0.30 ( 0.30)	1.00	24284.9	10300.00
26	19128.26	89.11	1.089	0.30 ( 0.30)	1.00	24297.6	10320.00
27	18618.31	93.72	1.067	0.30 ( 0.30)	1.00	24489.5	10210.00

28	16418.02	119.59	0.955	0.30	( 0.30)	1.00	25186.1	10100.00
TOTAL AREA (ACRES) =		25186.1						

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 21454.35 Tc (MIN.) = 44.688  
EFFECTIVE AREA (ACRES) = 15226.35 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 25186.1  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

=====  
END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 25186.1 TC (MIN.) = 44.69  
EFFECTIVE AREA (ACRES) = 15226.35 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.999  
PEAK FLOW RATE (CFS) = 21454.35

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	18271.49	26.89	1.937	0.30 ( 0.30)	1.00	8025.2	11000.00
2	20528.79	37.71	1.593	0.30 ( 0.30)	1.00	12254.2	11330.00
3	20786.00	39.21	1.550	0.30 ( 0.30)	1.00	12878.7	10850.00
4	20891.66	39.94	1.529	0.30 ( 0.30)	1.00	13187.6	11350.00
5	20911.18	40.08	1.526	0.30 ( 0.30)	1.00	13246.6	10800.00
6	21179.27	41.89	1.497	0.30 ( 0.30)	1.00	14067.5	10900.00
7	21317.19	43.14	1.476	0.30 ( 0.30)	1.00	14598.3	11300.00
8	21433.15	44.35	1.457	0.30 ( 0.30)	1.00	15096.6	11401.00
9	21454.10	44.68	1.452	0.30 ( 0.30)	1.00	15224.3	11250.00
10	21454.35	44.69	1.452	0.30 ( 0.30)	1.00	15226.4	11130.00
11	21451.83	44.99	1.447	0.30 ( 0.30)	1.00	15329.1	10830.00
12	21450.57	45.02	1.446	0.30 ( 0.30)	1.00	15338.6	10910.00
13	21414.84	45.44	1.439	0.30 ( 0.30)	1.00	15459.5	11220.00
14	21394.48	46.01	1.430	0.30 ( 0.30)	1.00	15616.5	10630.00
15	20974.20	56.97	1.313	0.30 ( 0.30)	1.00	18795.6	10600.00
16	20929.62	61.46	1.280	0.30 ( 0.30)	1.00	20113.9	11111.00
17	20945.89	62.29	1.274	0.30 ( 0.30)	1.00	20339.9	11201.00
18	20942.10	62.69	1.271	0.30 ( 0.30)	1.00	20436.0	11101.00
19	20917.86	63.60	1.265	0.30 ( 0.30)	1.00	20640.2	10500.00
20	20810.29	67.83	1.236	0.30 ( 0.30)	1.00	21523.6	10710.00
21	20714.83	69.76	1.223	0.30 ( 0.30)	1.00	21855.7	10410.00
22	20331.12	74.26	1.192	0.30 ( 0.30)	1.00	22516.7	10700.00
23	19773.12	80.98	1.145	0.30 ( 0.30)	1.00	23435.8	10400.00
24	19635.68	83.23	1.130	0.30 ( 0.30)	1.00	23705.6	10200.00
25	19146.98	88.93	1.090	0.30 ( 0.30)	1.00	24284.9	10300.00
26	19128.26	89.11	1.089	0.30 ( 0.30)	1.00	24297.6	10320.00
27	18618.31	93.72	1.067	0.30 ( 0.30)	1.00	24489.5	10210.00
28	16418.02	119.59	0.955	0.30 ( 0.30)	1.00	25186.1	10100.00

=====  
END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

-----  
FILE NAME: S15.DAT  
TIME/DATE OF STUDY: 10:07 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.850
- 2) 10.00; 3.678
- 3) 15.00; 2.780
- 4) 20.00; 2.308
- 5) 25.00; 1.981
- 6) 30.00; 1.786
- 7) 40.00; 1.505
- 8) 50.00; 1.344
- 9) 60.00; 1.258
- 10) 90.00; 1.053
- 11) 120.00; 0.923
- 12) 180.00; 0.808
- 13) 360.00; 0.611
- 14) 1440.00; 0.272

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11500.00 TO NODE 11501.00 IS CODE = 21  
-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 352.85  
ELEVATION DATA: UPSTREAM(FEET) = 1891.25 DOWNSTREAM(FEET) = 1665.22

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.064  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 4.519  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 1.58 0.30 1.000 0 8.06  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 6.00  
TOTAL AREA (ACRES) = 1.58 PEAK FLOW RATE (CFS) = 6.00

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11501.00 TO NODE 11502.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1665.22 DOWNSTREAM(FEET) = 1423.64  
CHANNEL LENGTH THRU SUBAREA(FEET) = 627.67 CHANNEL SLOPE = 0.3849  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.29  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.771  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN  
USER-DEFINED - 6.84 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.77  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.07  
AVERAGE FLOW DEPTH(FEET) = 0.26 TRAVEL TIME(MIN.) = 1.72  
Tc(MIN.) = 9.79  
SUBAREA AREA(ACRES) = 6.84 SUBAREA RUNOFF(CFS) = 21.37  
EFFECTIVE AREA(ACRES) = 8.42 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 8.4 PEAK FLOW RATE(CFS) = 26.30  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.35

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.35 FLOW VELOCITY(FEET/SEC.) = 7.11  
LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11502.00 = 980.52 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11502.00 TO NODE 11503.00 IS CODE = 56



-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1423.64 DOWNSTREAM(FEET) = 1258.86  
CHANNEL LENGTH THRU SUBAREA(FEET) = 937.16 CHANNEL SLOPE = 0.1758  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.77

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.352  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	28.16	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 65.08  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.69  
AVERAGE FLOW DEPTH(FEET) = 0.74 TRAVEL TIME(MIN.) = 2.03  
Tc(MIN.) = 11.82  
SUBAREA AREA(ACRES) = 28.16 SUBAREA RUNOFF(CFS) = 77.35  
EFFECTIVE AREA(ACRES) = 36.58 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 36.6 PEAK FLOW RATE(CFS) = 100.48  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.95

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.95 FLOW VELOCITY(FEET/SEC.) = 8.90  
LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11503.00 = 1917.68 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11503.00 TO NODE 11504.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1258.86 DOWNSTREAM(FEET) = 1009.04  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1924.29 CHANNEL SLOPE = 0.1298  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.51

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.766  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	69.67	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 178.11  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.63  
AVERAGE FLOW DEPTH(FEET) = 1.44 TRAVEL TIME(MIN.) = 3.33  
Tc(MIN.) = 15.15  
SUBAREA AREA(ACRES) = 69.67 SUBAREA RUNOFF(CFS) = 154.64  
EFFECTIVE AREA(ACRES) = 106.25 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 106.2 PEAK FLOW RATE(CFS) = 235.83

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.68

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.68 FLOW VELOCITY(FEET/SEC.) = 10.54  
LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11504.00 = 3841.97 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11504.00 TO NODE 11520.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1009.04 DOWNSTREAM(FEET) = 593.37  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2817.91 CHANNEL SLOPE = 0.1475  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.88  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.390

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	65.12	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 297.19  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.79  
AVERAGE FLOW DEPTH(FEET) = 1.84 TRAVEL TIME(MIN.) = 3.98  
Tc(MIN.) = 19.13  
SUBAREA AREA(ACRES) = 65.12 SUBAREA RUNOFF(CFS) = 122.50  
EFFECTIVE AREA(ACRES) = 171.37 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 171.4 PEAK FLOW RATE(CFS) = 322.38  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.93

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.93 FLOW VELOCITY(FEET/SEC.) = 12.09  
LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11520.00 = 6659.88 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11504.00 TO NODE 11520.00 IS CODE = 10  
-----

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

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11431.00 TO NODE 11431.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: S14.DNA  
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap (ACRES)	Ae (ACRES)	HEADWATER NODE
1	18271.49	26.89	0.30(0.30)	1.00	8025.2	11000.00

2	20528.79	37.71	0.30	( 0.30)	1.00	12254.2	11330.00
3	20911.18	40.08	0.30	( 0.30)	1.00	13246.6	10800.00
4	21179.27	41.89	0.30	( 0.30)	1.00	14067.5	10900.00
5	21317.19	43.14	0.30	( 0.30)	1.00	14598.3	11300.00
6	21454.35	44.69	0.30	( 0.30)	1.00	15226.4	11130.00
7	21414.84	45.44	0.30	( 0.30)	1.00	15459.5	11220.00
8	21394.48	46.01	0.30	( 0.30)	1.00	15616.5	10630.00
9	20974.20	56.97	0.30	( 0.30)	1.00	18795.6	10600.00
10	20929.62	61.46	0.30	( 0.30)	1.00	20113.9	11111.00
11	20945.89	62.29	0.30	( 0.30)	1.00	20339.9	11201.00
12	20917.86	63.60	0.30	( 0.30)	1.00	20640.2	10500.00
13	20810.29	67.83	0.30	( 0.30)	1.00	21523.6	10710.00
14	20714.83	69.76	0.30	( 0.30)	1.00	21855.7	10410.00
15	20331.12	74.26	0.30	( 0.30)	1.00	22516.7	10700.00
16	19773.12	80.98	0.30	( 0.30)	1.00	23435.8	10400.00
17	19635.68	83.23	0.30	( 0.30)	1.00	23705.6	10200.00
18	19146.98	88.93	0.30	( 0.30)	1.00	24284.9	10300.00
19	18618.31	93.72	0.30	( 0.30)	1.00	24489.5	10210.00
20	16418.02	119.59	0.30	( 0.30)	1.00	25186.1	10100.00

TOTAL AREA (ACRES) = 25186.1

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FLOW PROCESS FROM NODE 11431.00 TO NODE 11431.00 IS CODE = 14.0

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	18271.49	26.89	0.30 ( 0.30)	1.00	8025.2	11000.00
2	20528.79	37.71	0.30 ( 0.30)	1.00	12254.2	11330.00
3	20911.18	40.08	0.30 ( 0.30)	1.00	13246.6	10800.00
4	21179.27	41.89	0.30 ( 0.30)	1.00	14067.5	10900.00
5	21317.19	43.14	0.30 ( 0.30)	1.00	14598.3	11300.00
6	21454.35	44.69	0.30 ( 0.30)	1.00	15226.4	11130.00
7	21414.84	45.44	0.30 ( 0.30)	1.00	15459.5	11220.00
8	21394.48	46.01	0.30 ( 0.30)	1.00	15616.5	10630.00
9	20974.20	56.97	0.30 ( 0.30)	1.00	18795.6	10600.00
10	20929.62	61.46	0.30 ( 0.30)	1.00	20113.9	11111.00
11	20945.89	62.29	0.30 ( 0.30)	1.00	20339.9	11201.00
12	20917.86	63.60	0.30 ( 0.30)	1.00	20640.2	10500.00
13	20810.29	67.83	0.30 ( 0.30)	1.00	21523.6	10710.00
14	20714.83	69.76	0.30 ( 0.30)	1.00	21855.7	10410.00
15	20331.12	74.26	0.30 ( 0.30)	1.00	22516.7	10700.00
16	19773.12	80.98	0.30 ( 0.30)	1.00	23435.8	10400.00
17	19635.68	83.23	0.30 ( 0.30)	1.00	23705.6	10200.00
18	19146.98	88.93	0.30 ( 0.30)	1.00	24284.9	10300.00
19	18618.31	93.72	0.30 ( 0.30)	1.00	24489.5	10210.00
20	16418.02	119.59	0.30 ( 0.30)	1.00	25186.1	10100.00

TOTAL AREA (ACRES) = 25186.1

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FLOW PROCESS FROM NODE 11431.00 TO NODE 11520.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 651.70 DOWNSTREAM(FEET) = 593.37  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2004.08 CHANNEL SLOPE = 0.0291  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 14.06  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.404  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 54.88 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 21481.62  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 21.17  
 AVERAGE FLOW DEPTH(FEET) = 14.06 TRAVEL TIME(MIN.) = 1.58  
 Tc(MIN.) = 46.27  
 SUBAREA AREA(ACRES) = 54.88 SUBAREA RUNOFF(CFS) = 54.54  
 EFFECTIVE AREA(ACRES) = 15281.23 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 25241.0 PEAK FLOW RATE(CFS) = 21454.35  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 14.05

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 14.05 FLOW VELOCITY(FEET/SEC.) = 21.17

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11520.00 = 73228.04 FEET.

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FLOW PROCESS FROM NODE 11504.00 TO NODE 11520.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	18271.49	28.54	1.843	0.30 ( 0.30)	1.00	8080.1	11000.00
2	20528.79	39.31	1.524	0.30 ( 0.30)	1.00	12309.0	11330.00
3	20911.18	41.67	1.478	0.30 ( 0.30)	1.00	13301.5	10800.00
4	21179.27	43.47	1.449	0.30 ( 0.30)	1.00	14122.4	10900.00
5	21317.19	44.72	1.429	0.30 ( 0.30)	1.00	14653.2	11300.00
6	21454.35	46.27	1.404	0.30 ( 0.30)	1.00	15281.2	11130.00
7	21414.84	47.02	1.392	0.30 ( 0.30)	1.00	15514.4	11220.00
8	21394.48	47.59	1.383	0.30 ( 0.30)	1.00	15671.4	10630.00
9	20974.20	58.56	1.270	0.30 ( 0.30)	1.00	18850.4	10600.00
10	20929.62	63.05	1.237	0.30 ( 0.30)	1.00	20168.7	11111.00
11	20945.89	63.87	1.232	0.30 ( 0.30)	1.00	20394.7	11201.00
12	20917.86	65.19	1.223	0.30 ( 0.30)	1.00	20695.1	10500.00
13	20810.29	69.42	1.194	0.30 ( 0.30)	1.00	21578.5	10710.00
14	20714.83	71.36	1.180	0.30 ( 0.30)	1.00	21910.6	10410.00
15	20331.12	75.86	1.150	0.30 ( 0.30)	1.00	22571.6	10700.00
16	19773.12	82.60	1.104	0.30 ( 0.30)	1.00	23490.7	10400.00
17	19635.68	84.84	1.088	0.30 ( 0.30)	1.00	23760.5	10200.00
18	19146.98	90.55	1.051	0.30 ( 0.30)	1.00	24339.8	10300.00
19	18618.31	95.35	1.030	0.30 ( 0.30)	1.00	24544.4	10210.00
20	16418.02	121.28	0.921	0.30 ( 0.30)	1.00	25241.0	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11520.00 = 73228.04 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	322.38	19.13	2.390	0.30( 0.30)	1.00	171.4	11500.00

LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11520.00 = 6659.88 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16911.49	19.13	2.390	0.30( 0.30)	1.00	5587.5	11500.00
2	18509.48	28.54	1.843	0.30( 0.30)	1.00	8251.4	11000.00
3	20717.63	39.31	1.524	0.30( 0.30)	1.00	12480.4	11330.00
4	21092.89	41.67	1.478	0.30( 0.30)	1.00	13472.8	10800.00
5	21356.51	43.47	1.449	0.30( 0.30)	1.00	14293.7	10900.00
6	21491.33	44.72	1.429	0.30( 0.30)	1.00	14824.6	11300.00
7	21624.66	46.27	1.404	0.30( 0.30)	1.00	15452.6	11130.00
8	21583.27	47.02	1.392	0.30( 0.30)	1.00	15685.8	11220.00
9	21561.49	47.59	1.383	0.30( 0.30)	1.00	15842.8	10630.00
10	21123.87	58.56	1.270	0.30( 0.30)	1.00	19021.8	10600.00
11	21074.18	63.05	1.237	0.30( 0.30)	1.00	20340.1	11111.00
12	21089.57	63.87	1.232	0.30( 0.30)	1.00	20566.1	11201.00
13	21060.16	65.19	1.223	0.30( 0.30)	1.00	20866.5	10500.00
14	20948.13	69.42	1.194	0.30( 0.30)	1.00	21749.8	10710.00
15	20850.63	71.36	1.180	0.30( 0.30)	1.00	22081.9	10410.00
16	20462.17	75.86	1.150	0.30( 0.30)	1.00	22742.9	10700.00
17	19897.08	82.60	1.104	0.30( 0.30)	1.00	23662.1	10400.00
18	19757.26	84.84	1.088	0.30( 0.30)	1.00	23931.8	10200.00
19	19262.76	90.55	1.051	0.30( 0.30)	1.00	24511.1	10300.00
20	18730.88	95.35	1.030	0.30( 0.30)	1.00	24715.8	10210.00
21	16513.74	121.28	0.921	0.30( 0.30)	1.00	25412.4	10100.00

TOTAL AREA (ACRES) = 25412.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 21624.66 Tc(MIN.) = 46.266  
EFFECTIVE AREA(ACRES) = 15452.60 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 25412.4  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11520.00 = 73228.04 FEET.

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FLOW PROCESS FROM NODE 11520.00 TO NODE 11540.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 593.37 DOWNSTREAM(FEET) = 577.77  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1515.75 CHANNEL SLOPE = 0.0103  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.30  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.377  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	100.60	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 21673.41  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.91  
AVERAGE FLOW DEPTH(FEET) = 10.30 TRAVEL TIME(MIN.) = 1.69  
Tc(MIN.) = 47.96  
SUBAREA AREA(ACRES) = 100.60 SUBAREA RUNOFF(CFS) = 97.50  
EFFECTIVE AREA(ACRES) = 15553.20 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 25513.0 PEAK FLOW RATE(CFS) = 21624.66  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.29

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 10.29 FLOW VELOCITY(FEET/SEC.) = 14.89  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11540.00 = 74743.79 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11520.00 TO NODE 11540.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 47.96  
RAINFALL INTENSITY(INCH/HR) = 1.38  
AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 15553.20  
TOTAL STREAM AREA(ACRES) = 25512.96  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 21624.66

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FLOW PROCESS FROM NODE 11530.00 TO NODE 11531.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 278.68  
ELEVATION DATA: UPSTREAM(FEET) = 1593.31 DOWNSTREAM(FEET) = 1523.14

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.844  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 4.180  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "OPEN BRUSH"	-	1.18	0.30	1.000	0	8.84

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 4.12  
TOTAL AREA(ACRES) = 1.18 PEAK FLOW RATE(CFS) = 4.12

\*\*\*\*\*

FLOW PROCESS FROM NODE 11531.00 TO NODE 11532.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1523.14 DOWNSTREAM(FEET) = 1297.56  
CHANNEL LENGTH THRU SUBAREA(FEET) = 698.37 CHANNEL SLOPE = 0.3230  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.29

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.517

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	8.32	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.24

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.67

AVERAGE FLOW DEPTH(FEET) = 0.27 TRAVEL TIME(MIN.) = 2.05

Tc(MIN.) = 10.90

SUBAREA AREA(ACRES) = 8.32 SUBAREA RUNOFF(CFS) = 24.09

EFFECTIVE AREA(ACRES) = 9.50 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 9.5 PEAK FLOW RATE(CFS) = 27.50

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.37

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.37 FLOW VELOCITY(FEET/SEC.) = 6.90

LONGEST FLOWPATH FROM NODE 11530.00 TO NODE 11532.00 = 977.05 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11532.00 TO NODE 11533.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1297.56 DOWNSTREAM(FEET) = 1134.68  
CHANNEL LENGTH THRU SUBAREA(FEET) = 962.17 CHANNEL SLOPE = 0.1693  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.67

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.104

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.50	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 50.94

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.99

AVERAGE FLOW DEPTH(FEET) = 0.65 TRAVEL TIME(MIN.) = 2.30

Tc(MIN.) = 13.19

SUBAREA AREA(ACRES) = 18.50 SUBAREA RUNOFF(CFS) = 46.70

EFFECTIVE AREA(ACRES) = 28.00 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 28.0 PEAK FLOW RATE(CFS) = 70.67

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.78

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.78 FLOW VELOCITY(FEET/SEC.) = 7.80

LONGEST FLOWPATH FROM NODE 11530.00 TO NODE 11533.00 = 1939.22 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11533.00 TO NODE 11534.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1134.68 DOWNSTREAM(FEET) = 1002.72  
CHANNEL LENGTH THRU SUBAREA(FEET) = 956.78 CHANNEL SLOPE = 0.1379  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.48

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.816

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	98.44	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 182.39

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.92

AVERAGE FLOW DEPTH(FEET) = 1.43 TRAVEL TIME(MIN.) = 1.61

Tc(MIN.) = 14.80

SUBAREA AREA(ACRES) = 98.44 SUBAREA RUNOFF(CFS) = 222.90

EFFECTIVE AREA(ACRES) = 126.44 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 126.4 PEAK FLOW RATE(CFS) = 286.30

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.84

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.84 FLOW VELOCITY(FEET/SEC.) = 11.41

LONGEST FLOWPATH FROM NODE 11530.00 TO NODE 11534.00 = 2896.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11534.00 TO NODE 11535.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1002.72 DOWNSTREAM(FEET) = 816.20  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2160.78 CHANNEL SLOPE = 0.0863  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.63

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.484

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	134.87	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 419.11  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.79  
 AVERAGE FLOW DEPTH(FEET) = 2.57 TRAVEL TIME(MIN.) = 3.34  
 Tc(MIN.) = 18.14  
 SUBAREA AREA(ACRES) = 134.87 SUBAREA RUNOFF(CFS) = 265.09  
 EFFECTIVE AREA(ACRES) = 261.31 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 261.3 PEAK FLOW RATE(CFS) = 513.60  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.86

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.86 FLOW VELOCITY(FEET/SEC.) = 11.44  
 LONGEST FLOWPATH FROM NODE 11530.00 TO NODE 11535.00 = 5056.78 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11535.00 TO NODE 11540.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 816.20 DOWNSTREAM(FEET) = 577.77  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 3109.20 CHANNEL SLOPE = 0.0767  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.17  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.131

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 78.24 0.30 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 578.12  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.35  
 AVERAGE FLOW DEPTH(FEET) = 3.13 TRAVEL TIME(MIN.) = 4.57  
 Tc(MIN.) = 22.71

SUBAREA AREA(ACRES) = 78.24 SUBAREA RUNOFF(CFS) = 128.94  
 EFFECTIVE AREA(ACRES) = 339.55 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 339.5 PEAK FLOW RATE(CFS) = 559.59  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.09

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.09 FLOW VELOCITY(FEET/SEC.) = 11.22  
 LONGEST FLOWPATH FROM NODE 11530.00 TO NODE 11540.00 = 8165.98 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11535.00 TO NODE 11540.00 IS CODE = 1

-----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 22.71  
 RAINFALL INTENSITY(INCH/HR) = 2.13  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 339.55  
 TOTAL STREAM AREA(ACRES) = 339.55  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 559.59

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16911.49	20.95	2.246	0.30( 0.30)	1.00	5688.1	11500.00
1	18509.48	30.31	1.777	0.30( 0.30)	1.00	8352.0	11000.00
1	20717.63	41.03	1.488	0.30( 0.30)	1.00	12581.0	11330.00
1	21092.89	43.38	1.451	0.30( 0.30)	1.00	13573.4	10800.00
1	21356.51	45.17	1.422	0.30( 0.30)	1.00	14394.3	10900.00
1	21491.33	46.42	1.402	0.30( 0.30)	1.00	14925.2	11300.00
1	21624.66	47.96	1.377	0.30( 0.30)	1.00	15553.2	11130.00
1	21583.27	48.72	1.365	0.30( 0.30)	1.00	15786.4	11220.00
1	21561.49	49.29	1.355	0.30( 0.30)	1.00	15943.4	10630.00
1	21123.87	60.27	1.256	0.30( 0.30)	1.00	19122.4	10600.00
1	21074.18	64.76	1.225	0.30( 0.30)	1.00	20440.7	11111.00
1	21089.57	65.58	1.220	0.30( 0.30)	1.00	20666.7	11201.00
1	21060.16	66.90	1.211	0.30( 0.30)	1.00	20967.1	10500.00
1	20948.13	71.13	1.182	0.30( 0.30)	1.00	21850.4	10710.00
1	20850.63	73.07	1.169	0.30( 0.30)	1.00	22182.5	10410.00
1	20462.17	77.59	1.138	0.30( 0.30)	1.00	22843.5	10700.00
1	19897.08	84.33	1.092	0.30( 0.30)	1.00	23762.7	10400.00
1	19757.26	86.59	1.076	0.30( 0.30)	1.00	24032.4	10200.00
1	19262.76	92.31	1.043	0.30( 0.30)	1.00	24611.7	10300.00
1	18730.88	97.12	1.022	0.30( 0.30)	1.00	24816.4	10210.00
1	16513.74	123.12	0.917	0.30( 0.30)	1.00	25513.0	10100.00
2	559.59	22.71	2.131	0.30( 0.30)	1.00	339.5	11530.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	17460.22	20.95	2.246	0.30( 0.30)	1.00	6001.4	11500.00
2	17769.99	22.71	2.131	0.30( 0.30)	1.00	6525.9	11530.00
3	18960.92	30.31	1.777	0.30( 0.30)	1.00	8691.6	11000.00
4	21080.84	41.03	1.488	0.30( 0.30)	1.00	12920.6	11330.00
5	21444.52	43.38	1.451	0.30( 0.30)	1.00	13913.0	10800.00
6	21699.33	45.17	1.422	0.30( 0.30)	1.00	14733.9	10900.00
7	21828.00	46.42	1.402	0.30( 0.30)	1.00	15264.7	11300.00
8	21953.75	47.96	1.377	0.30( 0.30)	1.00	15892.8	11130.00
9	21908.65	48.72	1.365	0.30( 0.30)	1.00	16125.9	11220.00
10	21884.07	49.29	1.355	0.30( 0.30)	1.00	16282.9	10630.00
11	21416.09	60.27	1.256	0.30( 0.30)	1.00	19462.0	10600.00
12	21357.03	64.76	1.225	0.30( 0.30)	1.00	20780.3	11111.00
13	21370.69	65.58	1.220	0.30( 0.30)	1.00	21006.3	11201.00
14	21338.53	66.90	1.211	0.30( 0.30)	1.00	21306.6	10500.00
15	21217.68	71.13	1.182	0.30( 0.30)	1.00	22190.0	10710.00

16	21116.12	73.07	1.169	0.30	( 0.30)	1.00	22522.1	10410.00
17	20718.23	77.59	1.138	0.30	( 0.30)	1.00	23183.1	10700.00
18	20139.05	84.33	1.092	0.30	( 0.30)	1.00	24102.2	10400.00
19	19994.53	86.59	1.076	0.30	( 0.30)	1.00	24372.0	10200.00
20	19489.84	92.31	1.043	0.30	( 0.30)	1.00	24951.3	10300.00
21	18951.58	97.12	1.022	0.30	( 0.30)	1.00	25155.9	10210.00
22	16702.32	123.12	0.917	0.30	( 0.30)	1.00	25852.5	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 21953.75 Tc(MIN.) = 47.96  
EFFECTIVE AREA(ACRES) = 15892.75 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 25852.5  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11540.00 = 74743.79 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11540.00 TO NODE 11541.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 577.77 DOWNSTREAM(FEET) = 556.39  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2053.36 CHANNEL SLOPE = 0.0104  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.41  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.342  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	389.46	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 22136.39  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.06  
AVERAGE FLOW DEPTH(FEET) = 10.39 TRAVEL TIME(MIN.) = 2.27  
Tc(MIN.) = 50.23  
SUBAREA AREA(ACRES) = 389.46 SUBAREA RUNOFF(CFS) = 365.26  
EFFECTIVE AREA(ACRES) = 16282.21 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 26242.0 PEAK FLOW RATE(CFS) = 21953.75  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.34

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 10.34 FLOW VELOCITY(FEET/SEC.) = 15.02  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11541.00 = 76797.15 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11541.00 TO NODE 11542.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 556.39 DOWNSTREAM(FEET) = 523.29  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3267.94 CHANNEL SLOPE = 0.0101

GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.47  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.311

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	330.30	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 22103.98  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.91  
AVERAGE FLOW DEPTH(FEET) = 10.46 TRAVEL TIME(MIN.) = 3.65  
Tc(MIN.) = 53.89  
SUBAREA AREA(ACRES) = 330.30 SUBAREA RUNOFF(CFS) = 300.43  
EFFECTIVE AREA(ACRES) = 16612.51 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 26572.3 PEAK FLOW RATE(CFS) = 21953.75  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.42

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 10.42 FLOW VELOCITY(FEET/SEC.) = 14.88  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11542.00 = 80065.09 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11542.00 TO NODE 11543.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 523.29 DOWNSTREAM(FEET) = 493.61  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2857.94 CHANNEL SLOPE = 0.0104  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.39  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.283  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	285.11	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 22079.93  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.03  
AVERAGE FLOW DEPTH(FEET) = 10.38 TRAVEL TIME(MIN.) = 3.17  
Tc(MIN.) = 57.06  
SUBAREA AREA(ACRES) = 285.11 SUBAREA RUNOFF(CFS) = 252.34  
EFFECTIVE AREA(ACRES) = 16897.62 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 26857.4 PEAK FLOW RATE(CFS) = 21953.75  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.35

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 10.35 FLOW VELOCITY(FEET/SEC.) = 15.00  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11543.00 = 82923.02 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11543.00 TO NODE 11544.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 493.61 DOWNSTREAM(FEET) = 480.21  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1963.01 CHANNEL SLOPE = 0.0068  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.64  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.262

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	303.63	0.30	0.987	-

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.987

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 22085.69

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.98

AVERAGE FLOW DEPTH(FEET) = 11.62 TRAVEL TIME(MIN.) = 2.52

Tc(MIN.) = 59.58

SUBAREA AREA(ACRES) = 303.63 SUBAREA RUNOFF(CFS) = 263.87

EFFECTIVE AREA(ACRES) = 17201.25 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 27161.0 PEAK FLOW RATE(CFS) = 21953.75

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.58

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 11.58 FLOW VELOCITY(FEET/SEC.) = 12.95

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11544.00 = 84886.03 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11544.00 TO NODE 11545.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 480.21 DOWNSTREAM(FEET) = 456.90  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1914.49 CHANNEL SLOPE = 0.0122  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 9.94  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.247

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	184.16	0.30	1.000	-

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 22032.25

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.88

AVERAGE FLOW DEPTH(FEET) = 9.93 TRAVEL TIME(MIN.) = 2.01

Tc(MIN.) = 61.58

SUBAREA AREA(ACRES) = 184.16 SUBAREA RUNOFF(CFS) = 157.00

EFFECTIVE AREA(ACRES) = 17385.41 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 27345.2 PEAK FLOW RATE(CFS) = 21953.75

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT(FEET) = 9.91

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 9.91 FLOW VELOCITY(FEET/SEC.) = 15.87

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11545.00 = 86800.52 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11545.00 TO NODE 11726.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 456.90 DOWNSTREAM(FEET) = 436.21  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2322.79 CHANNEL SLOPE = 0.0089  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.81  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.229

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	151.95	0.30	0.844	-

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.844

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 22020.45

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.24

AVERAGE FLOW DEPTH(FEET) = 10.80 TRAVEL TIME(MIN.) = 2.72

Tc(MIN.) = 64.30

SUBAREA AREA(ACRES) = 151.95 SUBAREA RUNOFF(CFS) = 133.40

EFFECTIVE AREA(ACRES) = 17537.36 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 27497.1 PEAK FLOW RATE(CFS) = 21953.75

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.78

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 10.78 FLOW VELOCITY(FEET/SEC.) = 14.22

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11726.00 = 89123.31 FEET.

-----  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 27497.1 TC(MIN.) = 64.30

EFFECTIVE AREA(ACRES) = 17537.36 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.997

PEAK FLOW RATE(CFS) = 21953.75

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	17460.22	38.44	1.549	0.30( 0.30)	1.00	7646.0	11500.00
2	17769.99	40.10	1.503	0.30( 0.30)	1.00	8170.5	11530.00
3	18960.92	47.38	1.386	0.30( 0.30)	1.00	10336.2	11000.00
4	21080.84	57.57	1.279	0.30( 0.30)	1.00	14565.2	11330.00
5	21444.52	59.84	1.259	0.30( 0.30)	1.00	15557.6	10800.00
6	21699.33	61.57	1.247	0.30( 0.30)	1.00	16378.5	10900.00
7	21828.00	62.79	1.239	0.30( 0.30)	1.00	16909.3	11300.00
8	21953.75	64.30	1.229	0.30( 0.30)	1.00	17537.4	11130.00
9	21908.65	65.07	1.223	0.30( 0.30)	1.00	17770.5	11220.00
10	21884.07	65.64	1.219	0.30( 0.30)	1.00	17927.5	10630.00
11	21416.09	76.73	1.144	0.30( 0.30)	1.00	21106.6	10600.00
12	21357.03	81.24	1.113	0.30( 0.30)	1.00	22424.9	11111.00
13	21370.69	82.06	1.107	0.30( 0.30)	1.00	22650.9	11201.00
14	21338.53	83.38	1.098	0.30( 0.30)	1.00	22951.3	10500.00
15	21217.68	87.64	1.069	0.30( 0.30)	1.00	23834.6	10710.00
16	21116.12	89.61	1.056	0.30( 0.30)	1.00	24166.7	10410.00
17	20718.23	94.22	1.035	0.30( 0.30)	1.00	24827.7	10700.00
18	20139.05	101.11	1.005	0.30( 0.30)	1.00	25746.8	10400.00
19	19994.53	103.40	0.995	0.30( 0.30)	1.00	26016.6	10200.00
20	19489.84	109.25	0.970	0.30( 0.30)	1.00	26595.9	10300.00
21	18951.58	114.21	0.948	0.30( 0.30)	1.00	26800.5	10210.00
22	16702.32	140.88	0.883	0.30( 0.30)	1.00	27497.1	10100.00

=====  
 END OF RATIONAL METHOD ANALYSIS  
 =====



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

Analysis prepared by:

-----  
FILE NAME: S16.DAT  
TIME/DATE OF STUDY: 10:07 04/01/2013  
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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

---\*TIME-OF-CONCENTRATION MODEL\*---

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.850
- 2) 10.00; 3.678
- 3) 15.00; 2.780
- 4) 20.00; 2.308
- 5) 25.00; 1.981
- 6) 30.00; 1.786
- 7) 40.00; 1.505
- 8) 50.00; 1.344
- 9) 60.00; 1.258
- 10) 90.00; 1.053
- 11) 120.00; 0.923
- 12) 180.00; 0.808
- 13) 360.00; 0.611
- 14) 1440.00; 0.272

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11600.00 TO NODE 11601.00 IS CODE = 21  
-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 390.21  
ELEVATION DATA: UPSTREAM(FEET) = 3061.08 DOWNSTREAM(FEET) = 2962.88

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.120  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.657

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	1.79	0.30	1.000	0	10.12

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

SUBAREA RUNOFF(CFS) = 5.41

TOTAL AREA(ACRES) = 1.79 PEAK FLOW RATE(CFS) = 5.41

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11601.00 TO NODE 11602.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2962.88 DOWNSTREAM(FEET) = 2839.39  
CHANNEL LENGTH THRU SUBAREA(FEET) = 548.33 CHANNEL SLOPE = 0.2252  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.26

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.291

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	4.88	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.00

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.48

AVERAGE FLOW DEPTH(FEET) = 0.25 TRAVEL TIME(MIN.) = 2.04

Tc(MIN.) = 12.16

SUBAREA AREA(ACRES) = 4.88 SUBAREA RUNOFF(CFS) = 13.13

EFFECTIVE AREA(ACRES) = 6.67 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 6.7 PEAK FLOW RATE(CFS) = 17.95

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.32 FLOW VELOCITY(FEET/SEC.) = 5.22

LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11602.00 = 938.54 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11602.00 TO NODE 11603.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2839.39 DOWNSTREAM(FEET) = 2697.55  
CHANNEL LENGTH THRU SUBAREA(FEET) = 976.87 CHANNEL SLOPE = 0.1452  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.74

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.858

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	31.42	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 54.36

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.76

AVERAGE FLOW DEPTH(FEET) = 0.70 TRAVEL TIME(MIN.) = 2.41

Tc(MIN.) = 14.57

SUBAREA AREA(ACRES) = 31.42 SUBAREA RUNOFF(CFS) = 72.34

EFFECTIVE AREA(ACRES) = 38.09 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 38.1 PEAK FLOW RATE(CFS) = 87.69

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.93

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.93 FLOW VELOCITY(FEET/SEC.) = 7.97

LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11603.00 = 1915.41 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11603.00 TO NODE 11604.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2697.55 DOWNSTREAM(FEET) = 2598.90  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1887.15 CHANNEL SLOPE = 0.0523  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.81

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.382

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	72.03	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 155.55

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.76

AVERAGE FLOW DEPTH(FEET) = 1.71 TRAVEL TIME(MIN.) = 4.65

Tc(MIN.) = 19.22

SUBAREA AREA(ACRES) = 72.03 SUBAREA RUNOFF(CFS) = 134.96

EFFECTIVE AREA(ACRES) = 110.12 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 110.1 PEAK FLOW RATE(CFS) = 206.33

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.00

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.00 FLOW VELOCITY(FEET/SEC.) = 7.35

LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11604.00 = 3802.56 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11604.00 TO NODE 11605.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2598.90 DOWNSTREAM(FEET) = 2464.25  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2488.89 CHANNEL SLOPE = 0.0541  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.42

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.027

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	96.28	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 281.34

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.16

AVERAGE FLOW DEPTH(FEET) = 2.35 TRAVEL TIME(MIN.) = 5.08

Tc(MIN.) = 24.30

SUBAREA AREA(ACRES) = 96.28 SUBAREA RUNOFF(CFS) = 149.61

EFFECTIVE AREA(ACRES) = 206.40 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 206.4 PEAK FLOW RATE(CFS) = 320.74

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.52

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.52 FLOW VELOCITY(FEET/SEC.) = 8.46

LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11605.00 = 6291.45 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11605.00 TO NODE 11606.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2464.25 DOWNSTREAM(FEET) = 2359.99  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1936.71 CHANNEL SLOPE = 0.0538  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.28

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.877

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	266.26	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 509.90  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.62  
 AVERAGE FLOW DEPTH(FEET) = 3.22 TRAVEL TIME(MIN.) = 3.35  
 Tc(MIN.) = 27.66  
 SUBAREA AREA(ACRES) = 266.26 SUBAREA RUNOFF(CFS) = 378.00  
 EFFECTIVE AREA(ACRES) = 472.66 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 472.7 PEAK FLOW RATE(CFS) = 671.02  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.71

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.71 FLOW VELOCITY(FEET/SEC.) = 10.38  
 LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11606.00 = 8228.16 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11606.00 TO NODE 11607.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2359.99 DOWNSTREAM(FEET) = 1905.15  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 3829.49 CHANNEL SLOPE = 0.1188  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.24  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.726

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	132.44	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 756.05  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.30  
 AVERAGE FLOW DEPTH(FEET) = 3.22 TRAVEL TIME(MIN.) = 4.46  
 Tc(MIN.) = 32.12  
 SUBAREA AREA(ACRES) = 132.44 SUBAREA RUNOFF(CFS) = 170.03  
 EFFECTIVE AREA(ACRES) = 605.10 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 605.1 PEAK FLOW RATE(CFS) = 776.84  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.26

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.26 FLOW VELOCITY(FEET/SEC.) = 14.41  
 LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11607.00 = 12057.65 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11607.00 TO NODE 11608.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1905.15 DOWNSTREAM(FEET) = 1717.92  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1095.02 CHANNEL SLOPE = 0.1710  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.06  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.696

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	76.91	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 825.15  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.71  
 AVERAGE FLOW DEPTH(FEET) = 3.06 TRAVEL TIME(MIN.) = 1.09  
 Tc(MIN.) = 33.21  
 SUBAREA AREA(ACRES) = 76.91 SUBAREA RUNOFF(CFS) = 96.62  
 EFFECTIVE AREA(ACRES) = 682.01 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 682.0 PEAK FLOW RATE(CFS) = 856.75  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.12

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.12 FLOW VELOCITY(FEET/SEC.) = 16.88  
 LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11608.00 = 13152.67 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11608.00 TO NODE 11609.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1717.92 DOWNSTREAM(FEET) = 1516.24  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1480.24 CHANNEL SLOPE = 0.1362  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.70  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.654

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	328.91	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1057.12  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.48  
 AVERAGE FLOW DEPTH(FEET) = 3.69 TRAVEL TIME(MIN.) = 1.50  
 Tc(MIN.) = 34.71  
 SUBAREA AREA(ACRES) = 328.91 SUBAREA RUNOFF(CFS) = 400.73  
 EFFECTIVE AREA(ACRES) = 1010.92 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 1010.9 PEAK FLOW RATE(CFS) = 1231.67  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.99

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.99 FLOW VELOCITY(FEET/SEC.) = 17.19  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11609.00 = 14632.91 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11609.00 TO NODE 11610.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1516.24 DOWNSTREAM(FEET) = 1332.01  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1925.38 CHANNEL SLOPE = 0.0957  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.73  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.596

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	355.16	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1438.87

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.73

AVERAGE FLOW DEPTH(FEET) = 4.71 TRAVEL TIME(MIN.) = 2.04

Tc(MIN.) = 36.75

SUBAREA AREA(ACRES) = 355.16 SUBAREA RUNOFF(CFS) = 414.39

EFFECTIVE AREA(ACRES) = 1366.08 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1366.1 PEAK FLOW RATE(CFS) = 1593.90

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.95

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 4.95 FLOW VELOCITY(FEET/SEC.) = 16.16

LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11610.00 = 16558.29 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11610.00 TO NODE 11611.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1332.01 DOWNSTREAM(FEET) = 1105.34  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2901.03 CHANNEL SLOPE = 0.0781  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.41  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.508

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	234.59	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1721.41

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.31

AVERAGE FLOW DEPTH(FEET) = 5.40 TRAVEL TIME(MIN.) = 3.16

Tc(MIN.) = 39.91

SUBAREA AREA(ACRES) = 234.59 SUBAREA RUNOFF(CFS) = 254.97

EFFECTIVE AREA(ACRES) = 1600.67 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1600.7 PEAK FLOW RATE(CFS) = 1739.74

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.43

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 5.43 FLOW VELOCITY(FEET/SEC.) = 15.36

LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11611.00 = 19459.32 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11611.00 TO NODE 11612.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1105.34 DOWNSTREAM(FEET) = 1030.47  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1982.46 CHANNEL SLOPE = 0.0378  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.66

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.462

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	212.67	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1850.94

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.93

AVERAGE FLOW DEPTH(FEET) = 6.66 TRAVEL TIME(MIN.) = 2.77

Tc(MIN.) = 42.68

SUBAREA AREA(ACRES) = 212.67 SUBAREA RUNOFF(CFS) = 222.40

EFFECTIVE AREA(ACRES) = 1813.34 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1813.3 PEAK FLOW RATE(CFS) = 1896.32

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.73

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 6.73 FLOW VELOCITY(FEET/SEC.) = 12.01

LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11612.00 = 21441.78 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11612.00 TO NODE 11630.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1030.47 DOWNSTREAM(FEET) = 870.22  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3051.86 CHANNEL SLOPE = 0.0525  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 6.59  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.403  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 465.36 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2127.39  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 13.98  
 AVERAGE FLOW DEPTH (FEET) = 6.57 TRAVEL TIME (MIN.) = 3.64  
 Tc (MIN.) = 46.32  
 SUBAREA AREA (ACRES) = 465.36 SUBAREA RUNOFF (CFS) = 462.12  
 EFFECTIVE AREA (ACRES) = 2278.70 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 2278.7 PEAK FLOW RATE (CFS) = 2262.85  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.77

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 6.77 FLOW VELOCITY (FEET/SEC.) = 14.20  
 LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11630.00 = 24493.64 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11612.00 TO NODE 11630.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<  
 =====  
 TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION (MIN.) = 46.32  
 RAINFALL INTENSITY (INCH/HR) = 1.40  
 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA (ACRES) = 2278.70  
 TOTAL STREAM AREA (ACRES) = 2278.70  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 2262.85

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11620.00 TO NODE 11621.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
 =====

INITIAL SUBAREA FLOW-LENGTH (FEET) = 266.64  
 ELEVATION DATA: UPSTREAM (FEET) = 2567.03 DOWNSTREAM (FEET) = 2486.90  
 Tc = K \* [(LENGTH \*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 8.387  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 4.379  
 SUBAREA Tc AND LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
 NATURAL FAIR COVER  
 "CHAPARRAL, BROADLEAF" - 0.69 0.30 1.000 0 8.39  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF (CFS) = 2.53  
 TOTAL AREA (ACRES) = 0.69 PEAK FLOW RATE (CFS) = 2.53

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11621.00 TO NODE 11622.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 2486.90 DOWNSTREAM (FEET) = 2424.91  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 712.48 CHANNEL SLOPE = 0.0870  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.29  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 3.212  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 3.63 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 7.37  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 2.82  
 AVERAGE FLOW DEPTH (FEET) = 0.25 TRAVEL TIME (MIN.) = 4.21  
 Tc (MIN.) = 12.59  
 SUBAREA AREA (ACRES) = 3.63 SUBAREA RUNOFF (CFS) = 9.51  
 EFFECTIVE AREA (ACRES) = 4.32 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 4.3 PEAK FLOW RATE (CFS) = 11.32  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.32 FLOW VELOCITY (FEET/SEC.) = 3.29  
 LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11622.00 = 979.12 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11622.00 TO NODE 11623.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 2424.91 DOWNSTREAM (FEET) = 2351.48  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 977.46 CHANNEL SLOPE = 0.0751  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.59  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.642  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 13.42 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 25.55  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.21

AVERAGE FLOW DEPTH(FEET) = 0.55 TRAVEL TIME(MIN.) = 3.87  
Tc(MIN.) = 16.46  
SUBAREA AREA(ACRES) = 13.42 SUBAREA RUNOFF(CFS) = 28.29  
EFFECTIVE AREA(ACRES) = 17.74 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 17.7 PEAK FLOW RATE(CFS) = 37.40  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.68

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.68 FLOW VELOCITY(FEET/SEC.) = 4.81  
LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11623.00 = 1956.58 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11623.00 TO NODE 11624.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2351.48 DOWNSTREAM(FEET) = 2317.87  
CHANNEL LENGTH THRU SUBAREA(FEET) = 947.96 CHANNEL SLOPE = 0.0355  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.06  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.293  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	16.02	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 51.79  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.18  
AVERAGE FLOW DEPTH(FEET) = 1.03 TRAVEL TIME(MIN.) = 3.78  
Tc(MIN.) = 20.24

SUBAREA AREA(ACRES) = 16.02 SUBAREA RUNOFF(CFS) = 28.73  
EFFECTIVE AREA(ACRES) = 33.76 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 33.8 PEAK FLOW RATE(CFS) = 60.54  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.12

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.12 FLOW VELOCITY(FEET/SEC.) = 4.40  
LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11624.00 = 2904.54 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11624.00 TO NODE 11624.50 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2317.87 DOWNSTREAM(FEET) = 2292.33  
CHANNEL LENGTH THRU SUBAREA(FEET) = 758.23 CHANNEL SLOPE = 0.0337  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.43  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.123  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	32.93	0.30	0.984	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.984  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 87.64  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.86  
AVERAGE FLOW DEPTH(FEET) = 1.41 TRAVEL TIME(MIN.) = 2.60  
Tc(MIN.) = 22.84  
SUBAREA AREA(ACRES) = 32.93 SUBAREA RUNOFF(CFS) = 54.16  
EFFECTIVE AREA(ACRES) = 66.69 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 66.7 PEAK FLOW RATE(CFS) = 109.54  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.59

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.59 FLOW VELOCITY(FEET/SEC.) = 5.22  
LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11624.50 = 3662.77 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11624.50 TO NODE 11625.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2292.33 DOWNSTREAM(FEET) = 2256.59  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1098.98 CHANNEL SLOPE = 0.0325  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.91  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.938  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	48.16	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 145.06  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.60  
AVERAGE FLOW DEPTH(FEET) = 1.88 TRAVEL TIME(MIN.) = 3.27  
Tc(MIN.) = 26.11

SUBAREA AREA(ACRES) = 48.16 SUBAREA RUNOFF(CFS) = 71.00  
EFFECTIVE AREA(ACRES) = 114.85 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 114.9 PEAK FLOW RATE(CFS) = 169.45  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.05

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.05 FLOW VELOCITY(FEET/SEC.) = 5.87  
LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11625.00 = 4761.75 FEET.

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FLOW PROCESS FROM NODE 11625.00 TO NODE 11626.00 IS CODE = 56
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 2256.59 DOWNSTREAM(FEET) = 2104.66
CHANNEL LENGTH THRU SUBAREA(FEET) = 2056.93 CHANNEL SLOPE = 0.0739
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.34
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.795
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp        Ap   SCS
LAND USE            GROUP   (ACRES)  (INCH/HR) (DECIMAL) CN
USER-DEFINED        -       212.15   0.30     0.950   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.950
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 313.82
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.39
AVERAGE FLOW DEPTH(FEET) = 2.29 TRAVEL TIME(MIN.) = 3.65
Tc(MIN.) = 29.76
SUBAREA AREA(ACRES) = 212.15 SUBAREA RUNOFF(CFS) = 288.42
EFFECTIVE AREA(ACRES) = 327.00 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 327.0 PEAK FLOW RATE(CFS) = 443.15
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.75

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.75 FLOW VELOCITY(FEET/SEC.) = 10.39
LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11626.00 = 6818.68 FEET.

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FLOW PROCESS FROM NODE 11626.00 TO NODE 11627.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 2104.66 DOWNSTREAM(FEET) = 1837.03
CHANNEL LENGTH THRU SUBAREA(FEET) = 2716.08 CHANNEL SLOPE = 0.0985
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.84
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.688
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp        Ap   SCS
LAND USE            GROUP   (ACRES)  (INCH/HR) (DECIMAL) CN
USER-DEFINED        -       147.74   0.30     1.000   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 535.46
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.14
AVERAGE FLOW DEPTH(FEET) = 2.82 TRAVEL TIME(MIN.) = 3.73
Tc(MIN.) = 33.49
SUBAREA AREA(ACRES) = 147.74 SUBAREA RUNOFF(CFS) = 184.57
EFFECTIVE AREA(ACRES) = 474.74 AREA-AVERAGED Fm(INCH/HR) = 0.29

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AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 474.7 PEAK FLOW RATE(CFS) = 596.11
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.99

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.99 FLOW VELOCITY(FEET/SEC.) = 12.50
LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11627.00 = 9534.76 FEET.

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*****
FLOW PROCESS FROM NODE 11627.00 TO NODE 11628.00 IS CODE = 56
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1837.03 DOWNSTREAM(FEET) = 1393.93
CHANNEL LENGTH THRU SUBAREA(FEET) = 2077.86 CHANNEL SLOPE = 0.2132
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.70
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.632
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp        Ap   SCS
LAND USE            GROUP   (ACRES)  (INCH/HR) (DECIMAL) CN
USER-DEFINED        -       202.44   0.30     1.000   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 717.48
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 17.41
AVERAGE FLOW DEPTH(FEET) = 2.68 TRAVEL TIME(MIN.) = 1.99
Tc(MIN.) = 35.47
SUBAREA AREA(ACRES) = 202.44 SUBAREA RUNOFF(CFS) = 242.73
EFFECTIVE AREA(ACRES) = 677.18 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 677.2 PEAK FLOW RATE(CFS) = 814.95
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.87

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.87 FLOW VELOCITY(FEET/SEC.) = 18.03
LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11628.00 = 11612.62 FEET.

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*****
FLOW PROCESS FROM NODE 11628.00 TO NODE 11629.00 IS CODE = 56
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1393.93 DOWNSTREAM(FEET) = 1201.61
CHANNEL LENGTH THRU SUBAREA(FEET) = 2844.34 CHANNEL SLOPE = 0.0676
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 4.06
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.523
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp        Ap   SCS

```

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 141.55 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 892.86  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.20  
 AVERAGE FLOW DEPTH(FEET) = 4.05 TRAVEL TIME(MIN.) = 3.89  
 Tc(MIN.) = 39.36  
 SUBAREA AREA(ACRES) = 141.55 SUBAREA RUNOFF(CFS) = 155.80  
 EFFECTIVE AREA(ACRES) = 818.73 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 818.7 PEAK FLOW RATE(CFS) = 904.18  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.07

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.07 FLOW VELOCITY(FEET/SEC.) = 12.24  
 LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11629.00 = 14456.96 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11629.00 TO NODE 11630.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1201.61 DOWNSTREAM(FEET) = 870.22  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 3807.89 CHANNEL SLOPE = 0.0870  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.94  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.440  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 106.41 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 958.80  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.64  
 AVERAGE FLOW DEPTH(FEET) = 3.93 TRAVEL TIME(MIN.) = 4.65  
 Tc(MIN.) = 44.01  
 SUBAREA AREA(ACRES) = 106.41 SUBAREA RUNOFF(CFS) = 109.22  
 EFFECTIVE AREA(ACRES) = 925.14 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 925.1 PEAK FLOW RATE(CFS) = 952.56  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.92

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.92 FLOW VELOCITY(FEET/SEC.) = 13.60  
 LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11630.00 = 18264.85 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11629.00 TO NODE 11630.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 44.01  
 RAINFALL INTENSITY(INCH/HR) = 1.44  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.99  
 EFFECTIVE STREAM AREA(ACRES) = 925.14  
 TOTAL STREAM AREA(ACRES) = 925.14  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 952.56

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2262.85	46.32	1.403	0.30( 0.30)	1.00	2278.7	11600.00
2	952.56	44.01	1.440	0.30( 0.30)	0.99	925.1	11620.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3175.18	44.01	1.440	0.30( 0.30)	1.00	3090.6	11620.00
2	3184.56	46.32	1.403	0.30( 0.30)	1.00	3203.8	11600.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 3184.56 Tc(MIN.) = 46.32  
 EFFECTIVE AREA(ACRES) = 3203.84 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 3203.8  
 LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11630.00 = 24493.64 FEET.

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 3203.8 TC(MIN.) = 46.32  
 EFFECTIVE AREA(ACRES) = 3203.84 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.997  
 PEAK FLOW RATE(CFS) = 3184.56

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3175.18	44.01	1.440	0.30( 0.30)	1.00	3090.6	11620.00
2	3184.56	46.32	1.403	0.30( 0.30)	1.00	3203.8	11600.00

END OF RATIONAL METHOD ANALYSIS



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

Analysis prepared by:

-----  
FILE NAME: S17.DAT  
TIME/DATE OF STUDY: 10:07 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.850
- 2) 10.00; 3.678
- 3) 15.00; 2.780
- 4) 20.00; 2.308
- 5) 25.00; 1.981
- 6) 30.00; 1.786
- 7) 40.00; 1.505
- 8) 50.00; 1.344
- 9) 60.00; 1.258
- 10) 90.00; 1.053
- 11) 120.00; 0.923
- 12) 180.00; 0.808
- 13) 360.00; 0.611
- 14) 1440.00; 0.272

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11701.00 TO NODE 11702.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 291.79  
ELEVATION DATA: UPSTREAM(FEET) = 1581.05 DOWNSTREAM(FEET) = 1496.25

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.753  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 4.220  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 2.72 0.30 1.000 0 8.75  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 9.60  
TOTAL AREA (ACRES) = 2.72 PEAK FLOW RATE (CFS) = 9.60

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11702.00 TO NODE 11703.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1496.25 DOWNSTREAM(FEET) = 1254.33  
CHANNEL LENGTH THRU SUBAREA(FEET) = 563.54 CHANNEL SLOPE = 0.4293  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.34  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.670  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN  
USER-DEFINED - 10.12 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 24.98  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.26  
AVERAGE FLOW DEPTH(FEET) = 0.32 TRAVEL TIME(MIN.) = 1.29  
Tc(MIN.) = 10.05  
SUBAREA AREA(ACRES) = 10.12 SUBAREA RUNOFF(CFS) = 30.69  
EFFECTIVE AREA(ACRES) = 12.84 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 12.8 PEAK FLOW RATE(CFS) = 38.94  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.42

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.42 FLOW VELOCITY(FEET/SEC.) = 8.50  
LONGEST FLOWPATH FROM NODE 11701.00 TO NODE 11703.00 = 855.33 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11703.00 TO NODE 11704.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1254.33 DOWNSTREAM(FEET) = 1143.91  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1025.91 CHANNEL SLOPE = 0.1076  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.90

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.204

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	21.52	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 67.17

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.60

AVERAGE FLOW DEPTH(FEET) = 0.87 TRAVEL TIME(MIN.) = 2.59

Tc(MIN.) = 12.64

SUBAREA AREA(ACRES) = 21.52 SUBAREA RUNOFF(CFS) = 56.26

EFFECTIVE AREA(ACRES) = 34.36 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 34.4 PEAK FLOW RATE(CFS) = 89.82

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.03

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.03 FLOW VELOCITY(FEET/SEC.) = 7.27

LONGEST FLOWPATH FROM NODE 11701.00 TO NODE 11704.00 = 1881.24 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11704.00 TO NODE 11705.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1143.91 DOWNSTREAM(FEET) = 804.90  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1952.20 CHANNEL SLOPE = 0.1737  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.22

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.695

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	50.19	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 144.08

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.96

AVERAGE FLOW DEPTH(FEET) = 1.17 TRAVEL TIME(MIN.) = 3.27

Tc(MIN.) = 15.90

SUBAREA AREA(ACRES) = 50.19 SUBAREA RUNOFF(CFS) = 108.17

EFFECTIVE AREA(ACRES) = 84.55 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 84.6 PEAK FLOW RATE(CFS) = 182.23

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.34

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.34 FLOW VELOCITY(FEET/SEC.) = 10.74

LONGEST FLOWPATH FROM NODE 11701.00 TO NODE 11705.00 = 3833.44 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11705.00 TO NODE 11721.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 804.90 DOWNSTREAM(FEET) = 725.34  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1056.71 CHANNEL SLOPE = 0.0753  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.78

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.493

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	15.89	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 197.91

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.24

AVERAGE FLOW DEPTH(FEET) = 1.77 TRAVEL TIME(MIN.) = 2.14

Tc(MIN.) = 18.04

SUBAREA AREA(ACRES) = 15.89 SUBAREA RUNOFF(CFS) = 31.36

EFFECTIVE AREA(ACRES) = 100.44 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 100.4 PEAK FLOW RATE(CFS) = 198.24

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.77

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.77 FLOW VELOCITY(FEET/SEC.) = 8.25

LONGEST FLOWPATH FROM NODE 11701.00 TO NODE 11721.00 = 4890.15 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11705.00 TO NODE 11721.00 IS CODE = 10

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

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11630.00 TO NODE 11630.00 IS CODE = 15.1

-----  
>>>>DEFINE MEMORY BANK # 2 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: S16.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap (ACRES)	Ae (ACRES)	HEADWATER NODE
1	3175.18	44.01	0.30(0.30)	1.00	3090.6	11620.00

```

2      3184.56  46.32  0.30( 0.30) 1.00   3203.8  11600.00
TOTAL AREA(ACRES) =      3203.8

*****
FLOW PROCESS FROM NODE 11630.00 TO NODE 11630.00 IS CODE = 14.0
-----
>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<
=====
MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
STREAM      Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS)  (MIN.) (INCH/HR)  (ACRES)  NODE
1      3175.18  44.01  0.30( 0.30) 1.00   3090.6  11620.00
2      3184.56  46.32  0.30( 0.30) 1.00   3203.8  11600.00
TOTAL AREA(ACRES) =      3203.8

*****
FLOW PROCESS FROM NODE 11630.00 TO NODE 11721.00 IS CODE = 56
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 870.22 DOWNSTREAM(FEET) = 725.34
CHANNEL LENGTH THRU SUBAREA(FEET) = 3507.54 CHANNEL SLOPE = 0.0413
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 8.52
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.340
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/      SCS SOIL      AREA      Fp      Ap      SCS
LAND USE      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED      -      213.50      0.30      1.000      -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3284.53
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.29
AVERAGE FLOW DEPTH(FEET) = 8.51 TRAVEL TIME(MIN.) = 4.09
Tc(MIN.) = 50.41
SUBAREA AREA(ACRES) = 213.50 SUBAREA RUNOFF(CFS) = 199.94
EFFECTIVE AREA(ACRES) = 3417.34 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 3417.3 PEAK FLOW RATE(CFS) = 3203.35
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 8.41

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 8.41 FLOW VELOCITY(FEET/SEC.) = 14.20
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11721.00 = 28001.18 FEET.

*****
FLOW PROCESS FROM NODE 11705.00 TO NODE 11721.00 IS CODE = 11
-----
>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<
=====
** MAIN STREAM CONFLUENCE DATA **
STREAM      Q      Tc      Intensity      Fp(Fm)      Ap      Ae      HEADWATER

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NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)      (ACRES)  NODE
1      3198.31  48.11  1.374  0.30( 0.30) 1.00   3304.1  11620.00
2      3203.35  50.41  1.340  0.30( 0.30) 1.00   3417.3  11600.00
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11721.00 = 28001.18 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **
STREAM      Q      Tc      Intensity      Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)      (ACRES)  NODE
1      198.24  18.04  2.493  0.30( 0.30) 1.00   100.4  11701.00
LONGEST FLOWPATH FROM NODE 11701.00 TO NODE 11721.00 = 4890.15 FEET.

** PEAK FLOW RATE TABLE **
STREAM      Q      Tc      Intensity      Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS)  (MIN.) (INCH/HR) (INCH/HR)      (ACRES)  NODE
1      2644.90  18.04  2.493  0.30( 0.30) 1.00   1339.5  11701.00
2      3295.45  48.11  1.374  0.30( 0.30) 1.00   3404.6  11620.00
3      3297.41  50.41  1.340  0.30( 0.30) 1.00   3517.8  11600.00
TOTAL AREA(ACRES) =      3517.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 3297.41 Tc(MIN.) = 50.408
EFFECTIVE AREA(ACRES) = 3517.78 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 3517.8
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11721.00 = 28001.18 FEET.

*****
FLOW PROCESS FROM NODE 11721.00 TO NODE 11722.00 IS CODE = 56
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 725.34 DOWNSTREAM(FEET) = 657.70
CHANNEL LENGTH THRU SUBAREA(FEET) = 1845.27 CHANNEL SLOPE = 0.0367
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.17
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.313
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/      SCS SOIL      AREA      Fp      Ap      SCS
LAND USE      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED      -      185.10      0.30      1.000      -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3381.76
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.49
AVERAGE FLOW DEPTH(FEET) = 3.16 TRAVEL TIME(MIN.) = 3.24
Tc(MIN.) = 53.65
SUBAREA AREA(ACRES) = 185.10 SUBAREA RUNOFF(CFS) = 168.70
EFFECTIVE AREA(ACRES) = 3702.88 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 3702.9 PEAK FLOW RATE(CFS) = 3377.88
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.16

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.16 FLOW VELOCITY(FEET/SEC.) = 9.48

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LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11722.00 = 29846.45 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11722.00 TO NODE 11723.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 657.70 DOWNSTREAM(FEET) = 609.57
CHANNEL LENGTH THRU SUBAREA(FEET) = 1967.44 CHANNEL SLOPE = 0.0245
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.63
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.279

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 273.16 0.30 1.000 -

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3498.24

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.42

AVERAGE FLOW DEPTH(FEET) = 3.63 TRAVEL TIME(MIN.) = 3.90

Tc(MIN.) = 57.54

SUBAREA AREA(ACRES) = 273.16 SUBAREA RUNOFF(CFS) = 240.73

EFFECTIVE AREA(ACRES) = 3976.04 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 3976.0 PEAK FLOW RATE(CFS) = 3506.97

GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.64

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.64 FLOW VELOCITY(FEET/SEC.) = 8.42

LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11723.00 = 31813.89 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11723.00 TO NODE 11724.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 609.57 DOWNSTREAM(FEET) = 546.77
CHANNEL LENGTH THRU SUBAREA(FEET) = 2808.53 CHANNEL SLOPE = 0.0224
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.77

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.236

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 159.72 0.30 1.000 -

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3574.24

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.23

AVERAGE FLOW DEPTH(FEET) = 3.77 TRAVEL TIME(MIN.) = 5.69

Tc(MIN.) = 63.23

SUBAREA AREA(ACRES) = 159.72 SUBAREA RUNOFF(CFS) = 134.55
EFFECTIVE AREA(ACRES) = 4135.76 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 4135.8 PEAK FLOW RATE(CFS) = 3506.97
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.73

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.73 FLOW VELOCITY(FEET/SEC.) = 8.17

LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11724.00 = 34622.42 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11724.00 TO NODE 11725.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 546.77 DOWNSTREAM(FEET) = 483.75
CHANNEL LENGTH THRU SUBAREA(FEET) = 2921.33 CHANNEL SLOPE = 0.0216
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.80

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.195

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 134.67 0.30 0.917 -

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.917

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3562.72

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.13

AVERAGE FLOW DEPTH(FEET) = 3.80 TRAVEL TIME(MIN.) = 5.99

Tc(MIN.) = 69.22

SUBAREA AREA(ACRES) = 134.67 SUBAREA RUNOFF(CFS) = 111.50

EFFECTIVE AREA(ACRES) = 4270.43 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99

TOTAL AREA(ACRES) = 4270.4 PEAK FLOW RATE(CFS) = 3506.97

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.77

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.77 FLOW VELOCITY(FEET/SEC.) = 8.08

LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11725.00 = 37543.75 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11725.00 TO NODE 11726.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 483.75 DOWNSTREAM(FEET) = 436.21
CHANNEL LENGTH THRU SUBAREA(FEET) = 2685.66 CHANNEL SLOPE = 0.0177
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 4.03  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.155  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 121.44 0.30 0.986 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.986  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 3553.92  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.61  
 AVERAGE FLOW DEPTH (FEET) = 4.02 TRAVEL TIME (MIN.) = 5.88  
 Tc (MIN.) = 75.11  
 SUBAREA AREA (ACRES) = 121.44 SUBAREA RUNOFF (CFS) = 93.89  
 EFFECTIVE AREA (ACRES) = 4391.87 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 4391.9 PEAK FLOW RATE (CFS) = 3506.97  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 100.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 3.99

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 3.99 FLOW VELOCITY (FEET/SEC.) = 7.57  
 LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11726.00 = 40229.41 FEET.

=====  
 END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 4391.9 TC (MIN.) = 75.11  
 EFFECTIVE AREA (ACRES) = 4391.87 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.995  
 PEAK FLOW RATE (CFS) = 3506.97

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2677.44	44.89	1.426	0.30 ( 0.30)	0.99	2213.6	11701.00
2	3475.32	72.88	1.170	0.30 ( 0.30)	0.99	4278.6	11620.00
3	3506.97	75.11	1.155	0.30 ( 0.30)	0.99	4391.9	11600.00

=====  
 END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

-----  
FILE NAME: S18.DAT  
TIME/DATE OF STUDY: 11:58 04/03/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.806
- 2) 10.00; 3.657
- 3) 15.00; 2.768
- 4) 20.00; 2.299
- 5) 25.00; 1.975
- 6) 30.00; 1.780
- 7) 40.00; 1.501
- 8) 50.00; 1.340
- 9) 60.00; 1.252
- 10) 90.00; 1.047
- 11) 120.00; 0.917
- 12) 180.00; 0.801
- 13) 360.00; 0.604
- 14) 1440.00; 0.269

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11801.00 TO NODE 11802.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 970.31  
ELEVATION DATA: UPSTREAM(FEET) = 834.89 DOWNSTREAM(FEET) = 727.50

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 17.170  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.564  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 7.24 0.30 1.000 0 17.17  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 14.76  
TOTAL AREA (ACRES) = 7.24 PEAK FLOW RATE (CFS) = 14.76

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11802.00 TO NODE 11803.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 727.50 DOWNSTREAM(FEET) = 674.12  
CHANNEL LENGTH THRU SUBAREA(FEET) = 968.10 CHANNEL SLOPE = 0.0551  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.74  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.235  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN  
USER-DEFINED - 22.08 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 34.05  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.22  
AVERAGE FLOW DEPTH(FEET) = 0.71 TRAVEL TIME(MIN.) = 3.82  
Tc(MIN.) = 20.99  
SUBAREA AREA(ACRES) = 22.08 SUBAREA RUNOFF(CFS) = 38.45  
EFFECTIVE AREA(ACRES) = 29.32 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 29.3 PEAK FLOW RATE(CFS) = 51.06  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.90

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.90 FLOW VELOCITY(FEET/SEC.) = 4.82  
LONGEST FLOWPATH FROM NODE 11801.00 TO NODE 11803.00 = 1938.41 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11803.00 TO NODE 11804.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 674.12 DOWNSTREAM(FEET) = 554.40  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1864.27 CHANNEL SLOPE = 0.0642  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.13

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.923

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	35.55	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 77.09

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.82

AVERAGE FLOW DEPTH(FEET) = 1.09 TRAVEL TIME(MIN.) = 5.34

Tc(MIN.) = 26.33

SUBAREA AREA(ACRES) = 35.55 SUBAREA RUNOFF(CFS) = 51.93

EFFECTIVE AREA(ACRES) = 64.87 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 64.9 PEAK FLOW RATE(CFS) = 94.77

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.23

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.23 FLOW VELOCITY(FEET/SEC.) = 6.21

LONGEST FLOWPATH FROM NODE 11801.00 TO NODE 11804.00 = 3802.68 FEET.

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\*\*\*\*\*  
FLOW PROCESS FROM NODE 11804.00 TO NODE 11821.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 554.40 DOWNSTREAM(FEET) = 423.93  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1767.25 CHANNEL SLOPE = 0.0738  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.36

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.765

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	36.70	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 118.98

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.00

AVERAGE FLOW DEPTH(FEET) = 1.34 TRAVEL TIME(MIN.) = 4.21

Tc(MIN.) = 30.54

SUBAREA AREA(ACRES) = 36.70 SUBAREA RUNOFF(CFS) = 48.39

EFFECTIVE AREA(ACRES) = 101.57 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 101.6 PEAK FLOW RATE(CFS) = 133.93

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.43

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.43 FLOW VELOCITY(FEET/SEC.) = 7.27

LONGEST FLOWPATH FROM NODE 11801.00 TO NODE 11821.00 = 5569.93 FEET.

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\*\*\*\*\*  
FLOW PROCESS FROM NODE 11804.00 TO NODE 11821.00 IS CODE = 10  
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>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<

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\*\*\*\*\*  
FLOW PROCESS FROM NODE 11545.00 TO NODE 11726.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 2 <<<<

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PEAK FLOWRATE TABLE FILE NAME: S15.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	17460.22	38.44	0.30( 0.30)	1.00	7646.0	11500.00
2	17769.99	40.10	0.30( 0.30)	1.00	8170.5	11530.00
3	18960.92	47.38	0.30( 0.30)	1.00	10336.2	11000.00
4	21080.84	57.57	0.30( 0.30)	1.00	14565.2	11330.00
5	21444.52	59.84	0.30( 0.30)	1.00	15557.6	10800.00
6	21699.33	61.57	0.30( 0.30)	1.00	16378.5	10900.00
7	21828.00	62.79	0.30( 0.30)	1.00	16909.3	11300.00
8	21953.75	64.30	0.30( 0.30)	1.00	17537.4	11130.00
9	21884.07	65.64	0.30( 0.30)	1.00	17927.5	10630.00
10	21416.09	76.73	0.30( 0.30)	1.00	21106.6	10600.00
11	21370.69	82.06	0.30( 0.30)	1.00	22650.9	11201.00
12	21338.53	83.38	0.30( 0.30)	1.00	22951.3	10500.00
13	21217.68	87.64	0.30( 0.30)	1.00	23834.6	10710.00
14	21116.12	89.61	0.30( 0.30)	1.00	24166.7	10410.00
15	20718.23	94.22	0.30( 0.30)	1.00	24827.7	10700.00
16	20139.05	101.11	0.30( 0.30)	1.00	25746.8	10400.00
17	19994.53	103.40	0.30( 0.30)	1.00	26016.6	10200.00
18	19489.84	109.25	0.30( 0.30)	1.00	26595.9	10300.00
19	18951.58	114.21	0.30( 0.30)	1.00	26800.5	10210.00
20	16702.32	140.88	0.30( 0.30)	1.00	27497.1	10100.00
TOTAL AREA(ACRES) =						27497.1

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\*\*\*\*\*  
FLOW PROCESS FROM NODE 11725.00 TO NODE 11726.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<

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PEAK FLOWRATE TABLE FILE NAME: S17.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2677.44	44.89	0.30( 0.30)	0.99	2213.6	11701.00
2	3475.32	72.88	0.30( 0.30)	0.99	4278.6	11620.00
3	3506.97	75.11	0.30( 0.30)	0.99	4391.9	11600.00
TOTAL AREA(ACRES) =						4391.9

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11725.00 TO NODE 11726.00 IS CODE = 14.0  
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>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2677.44	44.89	0.30 ( 0.30)	0.99	2213.6	11701.00
2	3475.32	72.88	0.30 ( 0.30)	0.99	4278.6	11620.00
3	3506.97	75.11	0.30 ( 0.30)	0.99	4391.9	11600.00
TOTAL AREA (ACRES) =						4391.9

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11545.00 TO NODE 11726.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2677.44	44.89	1.422	0.30 ( 0.30)	0.99	2213.6	11701.00
2	3475.32	72.88	1.164	0.30 ( 0.30)	0.99	4278.6	11620.00
3	3506.97	75.11	1.149	0.30 ( 0.30)	0.99	4391.9	11600.00
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11726.00 = 40229.41 FEET.							

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	17460.22	38.44	1.545	0.30 ( 0.30)	1.00	7646.0	11500.00
2	17769.99	40.10	1.499	0.30 ( 0.30)	1.00	8170.5	11530.00
3	18960.92	47.38	1.382	0.30 ( 0.30)	1.00	10336.2	11000.00
4	21080.84	57.57	1.273	0.30 ( 0.30)	1.00	14565.2	11330.00
5	21444.52	59.84	1.253	0.30 ( 0.30)	1.00	15557.6	10800.00
6	21699.33	61.57	1.241	0.30 ( 0.30)	1.00	16378.5	10900.00
7	21828.00	62.79	1.233	0.30 ( 0.30)	1.00	16909.3	11300.00
8	21953.75	64.30	1.223	0.30 ( 0.30)	1.00	17537.4	11130.00
9	21884.07	65.64	1.213	0.30 ( 0.30)	1.00	17927.5	10630.00
10	21416.09	76.73	1.138	0.30 ( 0.30)	1.00	21106.6	10600.00
11	21370.69	82.06	1.101	0.30 ( 0.30)	1.00	22650.9	11201.00
12	21338.53	83.38	1.092	0.30 ( 0.30)	1.00	22951.3	10500.00
13	21217.68	87.64	1.063	0.30 ( 0.30)	1.00	23834.6	10710.00
14	21116.12	89.61	1.050	0.30 ( 0.30)	1.00	24166.7	10410.00
15	20718.23	94.22	1.029	0.30 ( 0.30)	1.00	24827.7	10700.00
16	20139.05	101.11	0.999	0.30 ( 0.30)	1.00	25746.8	10400.00
17	19994.53	103.40	0.989	0.30 ( 0.30)	1.00	26016.6	10200.00
18	19489.84	109.25	0.964	0.30 ( 0.30)	1.00	26595.9	10300.00
19	18951.58	114.21	0.942	0.30 ( 0.30)	1.00	26800.5	10210.00
20	16702.32	140.88	0.877	0.30 ( 0.30)	1.00	27497.1	10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11726.00 = 89123.31 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20002.22	38.44	1.545	0.30 ( 0.30)	0.99	9541.6	11500.00

2	20325.78	40.10	1.499	0.30 ( 0.30)	0.99	10148.0	11530.00
3	21230.48	44.89	1.422	0.30 ( 0.30)	1.00	11808.1	11701.00
4	21709.43	47.38	1.382	0.30 ( 0.30)	1.00	12733.7	11000.00
5	24119.72	57.57	1.273	0.30 ( 0.30)	1.00	17714.2	11330.00
6	24548.01	59.84	1.253	0.30 ( 0.30)	1.00	18873.9	10800.00
7	24852.18	61.57	1.241	0.30 ( 0.30)	1.00	19822.5	10900.00
8	25015.78	62.79	1.233	0.30 ( 0.30)	1.00	20443.8	11300.00
9	25184.55	64.30	1.223	0.30 ( 0.30)	1.00	21183.1	11130.00
10	25153.08	65.64	1.213	0.30 ( 0.30)	1.00	21672.2	10630.00
11	25053.90	72.88	1.164	0.30 ( 0.30)	1.00	24281.4	11620.00
12	24991.78	75.11	1.149	0.30 ( 0.30)	1.00	25031.6	11600.00
13	24877.17	76.73	1.138	0.30 ( 0.30)	1.00	25498.4	10600.00
14	24681.66	82.06	1.101	0.30 ( 0.30)	1.00	27042.7	11201.00
15	24612.24	83.38	1.092	0.30 ( 0.30)	1.00	27343.1	10500.00
16	24371.39	87.64	1.063	0.30 ( 0.30)	1.00	28226.5	10710.00
17	24214.52	89.61	1.050	0.30 ( 0.30)	1.00	28558.6	10410.00
18	23730.08	94.22	1.029	0.30 ( 0.30)	1.00	29219.6	10700.00
19	23027.83	101.11	0.999	0.30 ( 0.30)	1.00	30138.7	10400.00
20	22842.37	103.40	0.989	0.30 ( 0.30)	1.00	30408.5	10200.00
21	22233.13	109.25	0.964	0.30 ( 0.30)	1.00	30987.8	10300.00
22	21606.21	114.21	0.942	0.30 ( 0.30)	1.00	31192.4	10210.00
23	19087.10	140.88	0.877	0.30 ( 0.30)	1.00	31889.0	10100.00
TOTAL AREA (ACRES) =						31889.0	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 25184.55 Tc (MIN.) = 64.304  
 EFFECTIVE AREA (ACRES) = 21183.14 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 31889.0  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11726.00 = 89123.31 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11726.00 TO NODE 11821.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 436.21 DOWNSTREAM (FEET) = 423.93  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1621.39 CHANNEL SLOPE = 0.0076  
 GIVEN CHANNEL BASE (FEET) = 100.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 12.13  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.209  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	59.69	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 25208.98  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 14.00  
 AVERAGE FLOW DEPTH (FEET) = 12.13 TRAVEL TIME (MIN.) = 1.93  
 Tc (MIN.) = 66.23  
 SUBAREA AREA (ACRES) = 59.69 SUBAREA RUNOFF (CFS) = 48.86  
 EFFECTIVE AREA (ACRES) = 21242.83 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 31948.7 PEAK FLOW RATE (CFS) = 25184.55  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE



GIVEN CHANNEL BASE (FEET) = 100.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 12.12

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 12.12 FLOW VELOCITY (FEET/SEC.) = 13.99  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11804.00 TO NODE 11821.00 IS CODE = 11

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 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20002.22	40.51	1.493	0.30 ( 0.30)	0.99	9601.3	11500.00
2	20325.78	42.16	1.466	0.30 ( 0.30)	0.99	10207.7	11530.00
3	21230.48	46.92	1.390	0.30 ( 0.30)	1.00	11867.8	11701.00
4	21709.43	49.40	1.350	0.30 ( 0.30)	1.00	12793.4	11000.00
5	24119.72	59.53	1.256	0.30 ( 0.30)	1.00	17773.9	11330.00
6	24548.01	61.78	1.240	0.30 ( 0.30)	1.00	18933.6	10800.00
7	24852.18	63.51	1.228	0.30 ( 0.30)	1.00	19882.2	10900.00
8	25015.78	64.73	1.220	0.30 ( 0.30)	1.00	20503.5	11300.00
9	25184.55	66.23	1.209	0.30 ( 0.30)	1.00	21242.8	11130.00
10	25153.08	67.58	1.200	0.30 ( 0.30)	1.00	21731.9	10630.00
11	25053.90	74.82	1.151	0.30 ( 0.30)	1.00	24341.1	11620.00
12	24991.78	77.04	1.136	0.30 ( 0.30)	1.00	25091.3	11600.00
13	24877.17	78.67	1.124	0.30 ( 0.30)	1.00	25558.1	10600.00
14	24681.66	84.00	1.088	0.30 ( 0.30)	1.00	27102.4	11201.00
15	24612.24	85.33	1.079	0.30 ( 0.30)	1.00	27402.8	10500.00
16	24371.39	89.59	1.050	0.30 ( 0.30)	1.00	28286.2	10710.00
17	24214.52	91.56	1.040	0.30 ( 0.30)	1.00	28618.3	10410.00
18	23730.08	96.19	1.020	0.30 ( 0.30)	1.00	29279.3	10700.00
19	23027.83	103.09	0.990	0.30 ( 0.30)	1.00	30198.4	10400.00
20	22842.37	105.39	0.980	0.30 ( 0.30)	1.00	30468.2	10200.00
21	22233.13	111.26	0.955	0.30 ( 0.30)	1.00	31047.4	10300.00
22	21606.21	116.23	0.933	0.30 ( 0.30)	1.00	31252.1	10210.00
23	19087.10	142.98	0.873	0.30 ( 0.30)	1.00	31948.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	133.93	30.54	1.765	0.30 ( 0.30)	1.00	101.6	11801.00

LONGEST FLOWPATH FROM NODE 11801.00 TO NODE 11821.00 = 5569.93 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	18649.09	30.54	1.765	0.30 ( 0.30)	0.99	7339.8	11801.00
2	20111.27	40.51	1.493	0.30 ( 0.30)	0.99	9702.9	11500.00
3	20432.40	42.16	1.466	0.30 ( 0.30)	0.99	10309.3	11530.00
4	21330.10	46.92	1.390	0.30 ( 0.30)	1.00	11969.3	11701.00
5	21805.39	49.40	1.350	0.30 ( 0.30)	1.00	12895.0	11000.00
6	24207.14	59.53	1.256	0.30 ( 0.30)	1.00	17875.5	11330.00
7	24633.93	61.78	1.240	0.30 ( 0.30)	1.00	19035.1	10800.00

8	24937.02	63.51	1.228	0.30 ( 0.30)	1.00	19983.8	10900.00
9	25099.85	64.73	1.220	0.30 ( 0.30)	1.00	20605.0	11300.00
10	25267.69	66.23	1.209	0.30 ( 0.30)	1.00	21344.4	11130.00
11	25235.38	67.58	1.200	0.30 ( 0.30)	1.00	21833.5	10630.00
12	25131.67	74.82	1.151	0.30 ( 0.30)	1.00	24442.7	11620.00
13	25068.17	77.04	1.136	0.30 ( 0.30)	1.00	25192.9	11600.00
14	24952.54	78.67	1.124	0.30 ( 0.30)	1.00	25659.7	10600.00
15	24753.70	84.00	1.088	0.30 ( 0.30)	1.00	27204.0	11201.00
16	24683.45	85.33	1.079	0.30 ( 0.30)	1.00	27504.4	10500.00
17	24439.93	89.59	1.050	0.30 ( 0.30)	1.00	28387.7	10710.00
18	24282.20	91.56	1.040	0.30 ( 0.30)	1.00	28719.8	10410.00
19	23795.92	96.19	1.020	0.30 ( 0.30)	1.00	29380.8	10700.00
20	23090.93	103.09	0.990	0.30 ( 0.30)	1.00	30299.9	10400.00
21	22904.57	105.39	0.980	0.30 ( 0.30)	1.00	30569.7	10200.00
22	22293.00	111.26	0.955	0.30 ( 0.30)	1.00	31149.0	10300.00
23	21664.11	116.23	0.933	0.30 ( 0.30)	1.00	31353.7	10210.00
24	19139.44	142.98	0.873	0.30 ( 0.30)	1.00	32050.3	10100.00

TOTAL AREA (ACRES) = 32050.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE (CFS) = 25267.69 Tc (MIN.) = 66.235  
 EFFECTIVE AREA (ACRES) = 21344.40 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 32050.3  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11821.00 TO NODE 11822.00 IS CODE = 56

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 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 423.93 DOWNSTREAM (FEET) = 402.38  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1912.90 CHANNEL SLOPE = 0.0113  
 GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 7.69  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.194  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	201.91	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 25348.89  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 13.85  
 AVERAGE FLOW DEPTH (FEET) = 7.68 TRAVEL TIME (MIN.) = 2.30  
 Tc (MIN.) = 68.54  
 SUBAREA AREA (ACRES) = 201.91 SUBAREA RUNOFF (CFS) = 162.41  
 EFFECTIVE AREA (ACRES) = 21546.31 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 32252.2 PEAK FLOW RATE (CFS) = 25267.69  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 7.66

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 7.66 FLOW VELOCITY(FEET/SEC.) = 13.83  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11822.00 = 92657.60 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11822.00 TO NODE 11841.00 IS CODE = 56

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 402.38 DOWNSTREAM(FEET) = 380.74  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2380.10 CHANNEL SLOPE = 0.0091  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.16

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.173

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	116.13	0.30	1.000	-

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25313.29

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.88

AVERAGE FLOW DEPTH(FEET) = 8.16 TRAVEL TIME(MIN.) = 3.08

Tc(MIN.) = 71.62

SUBAREA AREA(ACRES) = 116.13 SUBAREA RUNOFF(CFS) = 91.21

EFFECTIVE AREA(ACRES) = 21662.44 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 32368.3 PEAK FLOW RATE(CFS) = 25267.69

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.15

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.15 FLOW VELOCITY(FEET/SEC.) = 12.88

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11841.00 = 95037.70 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11822.00 TO NODE 11841.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

-----  
TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 71.62

RAINFALL INTENSITY(INCH/HR) = 1.17

AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA(ACRES) = 21662.44

TOTAL STREAM AREA(ACRES) = 32368.29

PEAK FLOW RATE(CFS) AT CONFLUENCE = 25267.69

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11831.00 TO NODE 11832.00 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
INITIAL SUBAREA FLOW-LENGTH(FEET) = 248.20

ELEVATION DATA: UPSTREAM(FEET) = 1353.30 DOWNSTREAM(FEET) = 1280.02

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

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.179

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 4.440

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER						
"OPEN BRUSH"	-	0.76	0.30	1.000	0	8.18

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

SUBAREA RUNOFF(CFS) = 2.83

TOTAL AREA(ACRES) = 0.76 PEAK FLOW RATE(CFS) = 2.83

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11832.00 TO NODE 11833.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1280.02 DOWNSTREAM(FEET) = 1070.08  
CHANNEL LENGTH THRU SUBAREA(FEET) = 686.67 CHANNEL SLOPE = 0.3057

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.25

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.568

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	5.95	0.30	1.000	-

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.64

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.93

AVERAGE FLOW DEPTH(FEET) = 0.23 TRAVEL TIME(MIN.) = 2.32

Tc(MIN.) = 10.50

SUBAREA AREA(ACRES) = 5.95 SUBAREA RUNOFF(CFS) = 17.50

EFFECTIVE AREA(ACRES) = 6.71 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 6.7 PEAK FLOW RATE(CFS) = 19.73

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.31

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.31 FLOW VELOCITY(FEET/SEC.) = 6.00

LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11833.00 = 934.87 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11833.00 TO NODE 11834.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1070.08 DOWNSTREAM(FEET) = 913.56  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 977.36 CHANNEL SLOPE = 0.1601  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.68  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 3.141  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 23.21 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 49.51  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.79  
 AVERAGE FLOW DEPTH(FEET) = 0.65 TRAVEL TIME(MIN.) = 2.40  
 Tc(MIN.) = 12.90  
 SUBAREA AREA(ACRES) = 23.21 SUBAREA RUNOFF(CFS) = 59.36  
 EFFECTIVE AREA(ACRES) = 29.92 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 29.9 PEAK FLOW RATE(CFS) = 76.52  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.83  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.83 FLOW VELOCITY(FEET/SEC.) = 7.86  
 LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11834.00 = 1912.23 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11834.00 TO NODE 11835.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 913.56 DOWNSTREAM(FEET) = 727.99  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1875.63 CHANNEL SLOPE = 0.0989  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.51  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.616  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 73.73 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 153.71  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.40  
 AVERAGE FLOW DEPTH(FEET) = 1.42 TRAVEL TIME(MIN.) = 3.72  
 Tc(MIN.) = 16.62  
 SUBAREA AREA(ACRES) = 73.73 SUBAREA RUNOFF(CFS) = 153.69  
 EFFECTIVE AREA(ACRES) = 103.65 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 103.7 PEAK FLOW RATE(CFS) = 216.06  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.72

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.72 FLOW VELOCITY(FEET/SEC.) = 9.34  
 LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11835.00 = 3787.86 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11835.00 TO NODE 11836.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 727.99 DOWNSTREAM(FEET) = 611.39  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1896.64 CHANNEL SLOPE = 0.0615  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.41  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.282  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 93.31 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 299.41  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.68  
 AVERAGE FLOW DEPTH(FEET) = 2.35 TRAVEL TIME(MIN.) = 3.64  
 Tc(MIN.) = 20.26  
 SUBAREA AREA(ACRES) = 93.31 SUBAREA RUNOFF(CFS) = 166.46  
 EFFECTIVE AREA(ACRES) = 196.96 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 197.0 PEAK FLOW RATE(CFS) = 351.36  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.56  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.56 FLOW VELOCITY(FEET/SEC.) = 9.08  
 LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11836.00 = 5684.50 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11836.00 TO NODE 11837.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 611.39 DOWNSTREAM(FEET) = 508.59  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2178.15 CHANNEL SLOPE = 0.0472  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.09  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.013  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 98.92 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 427.71  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.74

AVERAGE FLOW DEPTH (FEET) = 3.04 TRAVEL TIME (MIN.) = 4.15  
Tc (MIN.) = 24.41  
SUBAREA AREA (ACRES) = 98.92 SUBAREA RUNOFF (CFS) = 152.52  
EFFECTIVE AREA (ACRES) = 295.88 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 295.9 PEAK FLOW RATE (CFS) = 456.19  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.15

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 3.15 FLOW VELOCITY (FEET/SEC.) = 8.90  
LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11837.00 = 7862.65 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11837.00 TO NODE 11838.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM (FEET) = 508.59 DOWNSTREAM (FEET) = 448.50  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1942.91 CHANNEL SLOPE = 0.0309  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.74  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.838  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	79.71	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 511.37  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.88  
AVERAGE FLOW DEPTH (FEET) = 3.72 TRAVEL TIME (MIN.) = 4.11  
Tc (MIN.) = 28.52

SUBAREA AREA (ACRES) = 79.71 SUBAREA RUNOFF (CFS) = 110.32  
EFFECTIVE AREA (ACRES) = 375.59 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 375.6 PEAK FLOW RATE (CFS) = 519.80  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.75

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 3.75 FLOW VELOCITY (FEET/SEC.) = 7.92  
LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11838.00 = 9805.56 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11838.00 TO NODE 11838.50 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM (FEET) = 448.50 DOWNSTREAM (FEET) = 420.79  
CHANNEL LENGTH THRU SUBAREA (FEET) = 917.65 CHANNEL SLOPE = 0.0302  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.86  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.768

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	34.57	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 542.63  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.94

AVERAGE FLOW DEPTH (FEET) = 3.86 TRAVEL TIME (MIN.) = 1.93  
Tc (MIN.) = 30.45  
SUBAREA AREA (ACRES) = 34.57 SUBAREA RUNOFF (CFS) = 45.66

EFFECTIVE AREA (ACRES) = 410.16 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 410.2 PEAK FLOW RATE (CFS) = 541.75

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.86

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 3.86 FLOW VELOCITY (FEET/SEC.) = 7.93  
LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11838.50 = 10723.21 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11838.50 TO NODE 11841.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM (FEET) = 420.79 DOWNSTREAM (FEET) = 380.74  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1615.83 CHANNEL SLOPE = 0.0248  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 4.10  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.667  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	21.54	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 555.00  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.44  
AVERAGE FLOW DEPTH (FEET) = 4.10 TRAVEL TIME (MIN.) = 3.62  
Tc (MIN.) = 34.07

SUBAREA AREA (ACRES) = 21.54 SUBAREA RUNOFF (CFS) = 26.49  
EFFECTIVE AREA (ACRES) = 431.70 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 431.7 PEAK FLOW RATE (CFS) = 541.75  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 4.05

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 4.05 FLOW VELOCITY (FEET/SEC.) = 7.39  
LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11841.00 = 12339.04 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11838.50 TO NODE 11841.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 34.07
RAINFALL INTENSITY(INCH/HR) = 1.67
AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 431.70
TOTAL STREAM AREA(ACRES) = 431.70
PEAK FLOW RATE(CFS) AT CONFLUENCE = 541.75

\*\* CONFLUENCE DATA \*\*

Table with columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 25 rows of data.

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

\*\* PEAK FLOW RATE TABLE \*\*

Table with columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 5 rows of data.

Table with columns: Node, Q, Tc, Intensity, Fp, Ap, Ae, HEADWATER. Contains 25 rows of data.

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 25613.65 Tc(MIN.) = 71.62
EFFECTIVE AREA(ACRES) = 22094.14 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 32800.0
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11841.00 = 95037.70 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11841.00 TO NODE 12527.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 380.74 DOWNSTREAM(FEET) = 347.47
CHANNEL LENGTH THRU SUBAREA(FEET) = 2830.43 CHANNEL SLOPE = 0.0118
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040
\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.64
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.150

SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 116.59 0.30 0.997 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.997
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25658.29
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.10
AVERAGE FLOW DEPTH(FEET) = 7.64 TRAVEL TIME(MIN.) = 3.35
Tc(MIN.) = 74.96
SUBAREA AREA(ACRES) = 116.59 SUBAREA RUNOFF(CFS) = 89.27
EFFECTIVE AREA(ACRES) = 22210.73 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 32916.6 PEAK FLOW RATE(CFS) = 25613.65
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040
\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.63

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 7.63 FLOW VELOCITY(FEET/SEC.) = 14.09  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

=====  
 END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 32916.6 TC(MIN.) = 74.96  
 EFFECTIVE AREA(ACRES) = 22210.73 AREA-AVERAGED Fm(INCH/HR)= 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.997  
 PEAK FLOW RATE(CFS) = 25613.65

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	18857.19	37.78	1.563	0.30( 0.30)	1.00	7696.9	11831.00
2	19164.00	40.18	1.498	0.30( 0.30)	1.00	8206.2	11801.00
3	20547.11	49.92	1.341	0.30( 0.30)	1.00	10569.2	11500.00
4	20857.89	51.52	1.327	0.30( 0.30)	1.00	11175.6	11530.00
5	21733.29	56.15	1.286	0.30( 0.30)	1.00	12835.7	11701.00
6	22200.08	58.56	1.265	0.30( 0.30)	1.00	13761.3	11000.00
7	24571.06	68.38	1.195	0.30( 0.30)	1.00	18741.8	11330.00
8	24991.82	70.58	1.180	0.30( 0.30)	1.00	19901.5	10800.00
9	25290.30	72.27	1.168	0.30( 0.30)	1.00	20850.1	10900.00
10	25449.86	73.48	1.160	0.30( 0.30)	1.00	21471.4	11300.00
11	25613.65	74.96	1.150	0.30( 0.30)	1.00	22210.7	11130.00
12	25577.70	76.31	1.141	0.30( 0.30)	1.00	22699.8	10630.00
13	25454.36	83.56	1.091	0.30( 0.30)	1.00	25309.0	11620.00
14	25384.82	85.79	1.076	0.30( 0.30)	1.00	26059.2	11600.00
15	25264.75	87.44	1.065	0.30( 0.30)	1.00	26526.0	10600.00
16	25051.43	92.79	1.035	0.30( 0.30)	1.00	28070.3	11201.00
17	24978.32	94.13	1.029	0.30( 0.30)	1.00	28370.7	10500.00
18	24727.44	98.42	1.011	0.30( 0.30)	1.00	29254.1	10710.00
19	24566.31	100.41	1.002	0.30( 0.30)	1.00	29586.2	10410.00
20	24072.02	105.10	0.982	0.30( 0.30)	1.00	30247.2	10700.00
21	23355.07	112.09	0.951	0.30( 0.30)	1.00	31166.3	10400.00
22	23164.74	114.41	0.941	0.30( 0.30)	1.00	31436.1	10200.00
23	22543.01	120.36	0.916	0.30( 0.30)	1.00	32015.3	10300.00
24	21907.27	125.43	0.907	0.30( 0.30)	1.00	32220.0	10210.00
25	19361.93	152.56	0.854	0.30( 0.30)	1.00	32916.6	10100.00

=====  
 END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2013 Advanced Engineering Software (aes)  
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

-----  
FILE NAME: S19.DAT  
TIME/DATE OF STUDY: 09:43 09/12/2017  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.535
- 2) 10.00; 3.529
- 3) 15.00; 2.693
- 4) 20.00; 2.246
- 5) 25.00; 1.938
- 6) 30.00; 1.744
- 7) 40.00; 1.475
- 8) 50.00; 1.313
- 9) 60.00; 1.214
- 10) 90.00; 1.010
- 11) 120.00; 0.880
- 12) 180.00; 0.760
- 13) 360.00; 0.566
- 14) 1200.00; 0.250

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11900.00 TO NODE 11901.00 IS CODE = 21  
-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 295.79  
ELEVATION DATA: UPSTREAM(FEET) = 2369.48 DOWNSTREAM(FEET) = 2332.92

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.203  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 4.651  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)  
RESIDENTIAL  
".4 DWELLING/ACRE" - 1.62 0.30 0.999 0 7.20  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.999  
SUBAREA RUNOFF(CFS) = 6.34  
TOTAL AREA(ACRES) = 1.62 PEAK FLOW RATE(CFS) = 6.34

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11901.00 TO NODE 11902.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2332.92 DOWNSTREAM(FEET) = 2297.70  
CHANNEL LENGTH THRU SUBAREA(FEET) = 664.26 CHANNEL SLOPE = 0.0530  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.57  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.443  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN  
USER-DEFINED - 8.35 0.30 0.906 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.906  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.40  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.34  
AVERAGE FLOW DEPTH(FEET) = 0.50 TRAVEL TIME(MIN.) = 3.31  
Tc(MIN.) = 10.52  
SUBAREA AREA(ACRES) = 8.35 SUBAREA RUNOFF(CFS) = 23.83  
EFFECTIVE AREA(ACRES) = 9.97 AREA-AVERAGED Fm(INCH/HR) = 0.28  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.92  
TOTAL AREA(ACRES) = 10.0 PEAK FLOW RATE(CFS) = 28.41  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.65

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.65 FLOW VELOCITY(FEET/SEC.) = 3.90  
LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11902.00 = 960.05 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11902.00 TO NODE 11902.50 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2297.70 DOWNSTREAM(FEET) = 2263.40  
CHANNEL LENGTH THRU SUBAREA(FEET) = 928.77 CHANNEL SLOPE = 0.0369  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.28

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.887

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	34.48	0.30	0.904	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.904

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 69.30

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.65

AVERAGE FLOW DEPTH(FEET) = 1.20 TRAVEL TIME(MIN.) = 3.33

Tc(MIN.) = 13.84

SUBAREA AREA(ACRES) = 34.48 SUBAREA RUNOFF(CFS) = 81.16

EFFECTIVE AREA(ACRES) = 44.45 AREA-AVERAGED Fm(INCH/HR) = 0.27

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.91

TOTAL AREA(ACRES) = 44.5 PEAK FLOW RATE(CFS) = 104.58

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.51

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.51 FLOW VELOCITY(FEET/SEC.) = 5.30

LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11902.50 = 1888.82 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11902.50 TO NODE 11903.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2263.40 DOWNSTREAM(FEET) = 2252.14  
CHANNEL LENGTH THRU SUBAREA(FEET) = 895.50 CHANNEL SLOPE = 0.0126  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.32

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.451

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	23.65	0.30	0.958	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.958

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 127.65

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.87

AVERAGE FLOW DEPTH(FEET) = 2.27 TRAVEL TIME(MIN.) = 3.86

Tc(MIN.) = 17.70

SUBAREA AREA(ACRES) = 23.65 SUBAREA RUNOFF(CFS) = 46.06

EFFECTIVE AREA(ACRES) = 68.10 AREA-AVERAGED Fm(INCH/HR) = 0.28

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.93

TOTAL AREA(ACRES) = 68.1 PEAK FLOW RATE(CFS) = 133.24

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.32 FLOW VELOCITY(FEET/SEC.) = 3.91

LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11903.00 = 2784.32 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11903.00 TO NODE 11904.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2252.14 DOWNSTREAM(FEET) = 2186.04  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1924.35 CHANNEL SLOPE = 0.0343  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.21

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.067

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	68.53	0.30	0.961	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.961

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 188.28

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.16

AVERAGE FLOW DEPTH(FEET) = 2.14 TRAVEL TIME(MIN.) = 5.20

Tc(MIN.) = 22.91

SUBAREA AREA(ACRES) = 68.53 SUBAREA RUNOFF(CFS) = 109.71

EFFECTIVE AREA(ACRES) = 136.63 AREA-AVERAGED Fm(INCH/HR) = 0.28

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.94

TOTAL AREA(ACRES) = 136.6 PEAK FLOW RATE(CFS) = 219.39

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.32 FLOW VELOCITY(FEET/SEC.) = 6.45

LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11904.00 = 4708.67 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11904.00 TO NODE 11905.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2186.04 DOWNSTREAM(FEET) = 1957.34  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1926.87 CHANNEL SLOPE = 0.1187  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.86

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.901

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	63.15	0.30	1.000	-



SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 264.91  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.57  
 AVERAGE FLOW DEPTH(FEET) = 1.83 TRAVEL TIME(MIN.) = 3.04  
 Tc(MIN.) = 25.94  
 SUBAREA AREA(ACRES) = 63.15 SUBAREA RUNOFF(CFS) = 91.02  
 EFFECTIVE AREA(ACRES) = 199.78 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA(ACRES) = 199.8 PEAK FLOW RATE(CFS) = 290.04  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.93

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.93 FLOW VELOCITY(FEET/SEC.) = 10.86  
 LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11905.00 = 6635.54 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11905.00 TO NODE 11906.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1957.34 DOWNSTREAM(FEET) = 1244.16  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2498.96 CHANNEL SLOPE = 0.2854  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.68  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.797

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	84.87	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 347.25  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.54  
 AVERAGE FLOW DEPTH(FEET) = 1.67 TRAVEL TIME(MIN.) = 2.68  
 Tc(MIN.) = 28.62  
 SUBAREA AREA(ACRES) = 84.87 SUBAREA RUNOFF(CFS) = 114.38  
 EFFECTIVE AREA(ACRES) = 284.65 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 284.6 PEAK FLOW RATE(CFS) = 385.73  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.77

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.77 FLOW VELOCITY(FEET/SEC.) = 16.06  
 LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11906.00 = 9134.50 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11906.00 TO NODE 11920.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1244.16 DOWNSTREAM(FEET) = 873.95  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 3370.75 CHANNEL SLOPE = 0.1098  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.70  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.659

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	199.43	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 507.80  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.43  
 AVERAGE FLOW DEPTH(FEET) = 2.67 TRAVEL TIME(MIN.) = 4.52  
 Tc(MIN.) = 33.14  
 SUBAREA AREA(ACRES) = 199.43 SUBAREA RUNOFF(CFS) = 244.01  
 EFFECTIVE AREA(ACRES) = 484.08 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98  
 TOTAL AREA(ACRES) = 484.1 PEAK FLOW RATE(CFS) = 594.38  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.90

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.90 FLOW VELOCITY(FEET/SEC.) = 12.99  
 LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11920.00 = 12505.25 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11906.00 TO NODE 11920.00 IS CODE = 1

-----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 33.14  
 RAINFALL INTENSITY(INCH/HR) = 1.66  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.98  
 EFFECTIVE STREAM AREA(ACRES) = 484.08  
 TOTAL STREAM AREA(ACRES) = 484.08  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 594.38

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11910.00 TO NODE 11911.00 IS CODE = 21

-----  
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 517.62  
 ELEVATION DATA: UPSTREAM(FEET) = 2531.88 DOWNSTREAM(FEET) = 2441.33

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.185  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.164  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc
USER-DEFINED	-	199.43	0.30	1.000	-	

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 3.46 0.30 1.000 0 12.19  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 8.92  
TOTAL AREA(ACRES) = 3.46 PEAK FLOW RATE(CFS) = 8.92

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11911.00 TO NODE 11912.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2441.33 DOWNSTREAM(FEET) = 2382.20  
CHANNEL LENGTH THRU SUBAREA(FEET) = 397.30 CHANNEL SLOPE = 0.1488  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.35  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.909

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 5.79 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 15.73  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.35  
AVERAGE FLOW DEPTH(FEET) = 0.34 TRAVEL TIME(MIN.) = 1.52  
Tc(MIN.) = 13.71  
SUBAREA AREA(ACRES) = 5.79 SUBAREA RUNOFF(CFS) = 13.60  
EFFECTIVE AREA(ACRES) = 9.25 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 9.2 PEAK FLOW RATE(CFS) = 21.72  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.41

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.41 FLOW VELOCITY(FEET/SEC.) = 4.93  
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11912.00 = 914.92 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11912.00 TO NODE 11913.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2382.20 DOWNSTREAM(FEET) = 2263.77  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1891.47 CHANNEL SLOPE = 0.0626  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.16  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.308

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 54.30 0.30 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 71.48  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.63  
AVERAGE FLOW DEPTH(FEET) = 1.05 TRAVEL TIME(MIN.) = 5.60  
Tc(MIN.) = 19.31  
SUBAREA AREA(ACRES) = 54.30 SUBAREA RUNOFF(CFS) = 98.12  
EFFECTIVE AREA(ACRES) = 63.55 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 63.5 PEAK FLOW RATE(CFS) = 114.83  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.38

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.38 FLOW VELOCITY(FEET/SEC.) = 6.54  
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11913.00 = 2806.39 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11913.00 TO NODE 11914.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2263.77 DOWNSTREAM(FEET) = 1845.23  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1957.31 CHANNEL SLOPE = 0.2138  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.23  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.110

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 65.14 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 167.95  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.26  
AVERAGE FLOW DEPTH(FEET) = 1.20 TRAVEL TIME(MIN.) = 2.90  
Tc(MIN.) = 22.21  
SUBAREA AREA(ACRES) = 65.14 SUBAREA RUNOFF(CFS) = 106.12  
EFFECTIVE AREA(ACRES) = 128.69 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 128.7 PEAK FLOW RATE(CFS) = 209.64  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.37

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.37 FLOW VELOCITY(FEET/SEC.) = 12.03  
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11914.00 = 4763.70 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11914.00 TO NODE 11915.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1845.23 DOWNSTREAM(FEET) = 1557.21  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1686.78 CHANNEL SLOPE = 0.1708  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.69  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.966  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 78.52 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 268.54  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.02  
 AVERAGE FLOW DEPTH(FEET) = 1.67 TRAVEL TIME(MIN.) = 2.34  
 Tc(MIN.) = 24.55  
 SUBAREA AREA(ACRES) = 78.52 SUBAREA RUNOFF(CFS) = 117.73  
 EFFECTIVE AREA(ACRES) = 207.21 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 207.2 PEAK FLOW RATE(CFS) = 310.69  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.81  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.81 FLOW VELOCITY(FEET/SEC.) = 12.58  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11915.00 = 6450.48 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11915.00 TO NODE 11916.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 1557.21 DOWNSTREAM(FEET) = 1403.38  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1909.39 CHANNEL SLOPE = 0.0806  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.42  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.833  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 70.48 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 359.32  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.08  
 AVERAGE FLOW DEPTH(FEET) = 2.41 TRAVEL TIME(MIN.) = 3.16  
 Tc(MIN.) = 27.70  
 SUBAREA AREA(ACRES) = 70.48 SUBAREA RUNOFF(CFS) = 97.25  
 EFFECTIVE AREA(ACRES) = 277.69 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 277.7 PEAK FLOW RATE(CFS) = 383.17  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.49

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.49 FLOW VELOCITY(FEET/SEC.) = 10.27  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11916.00 = 8359.87 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11916.00 TO NODE 11917.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 1403.38 DOWNSTREAM(FEET) = 1079.99  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1945.82 CHANNEL SLOPE = 0.1662  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.47  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.747  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 232.20 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 534.42  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.62  
 AVERAGE FLOW DEPTH(FEET) = 2.45 TRAVEL TIME(MIN.) = 2.22  
 Tc(MIN.) = 29.92  
 SUBAREA AREA(ACRES) = 232.20 SUBAREA RUNOFF(CFS) = 302.42  
 EFFECTIVE AREA(ACRES) = 509.89 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 509.9 PEAK FLOW RATE(CFS) = 664.09  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.75

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.75 FLOW VELOCITY(FEET/SEC.) = 15.57  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11917.00 = 10305.69 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11917.00 TO NODE 11920.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 1079.99 DOWNSTREAM(FEET) = 873.95  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2563.91 CHANNEL SLOPE = 0.0804  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.51  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.653  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 110.82 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 731.56  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.30

AVERAGE FLOW DEPTH(FEET) = 3.50 TRAVEL TIME(MIN.) = 3.47  
 Tc(MIN.) = 33.40  
 SUBAREA AREA(ACRES) = 110.82 SUBAREA RUNOFF(CFS) = 134.92  
 EFFECTIVE AREA(ACRES) = 620.71 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 620.7 PEAK FLOW RATE(CFS) = 755.69  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.56

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.56 FLOW VELOCITY(FEET/SEC.) = 12.41  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11920.00 = 12869.60 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11917.00 TO NODE 11920.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

\*\*\*\*\*  
 TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 33.40  
 RAINFALL INTENSITY(INCH/HR) = 1.65  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 620.71  
 TOTAL STREAM AREA(ACRES) = 620.71  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 755.69

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	594.38	33.14	1.659	0.30( 0.30)	0.98	484.1	11900.00
2	755.69	33.40	1.653	0.30( 0.30)	1.00	620.7	11910.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1348.14	33.14	1.659	0.30( 0.30)	0.99	1100.1	11900.00
2	1347.14	33.40	1.653	0.30( 0.30)	0.99	1104.8	11910.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 1348.14 Tc(MIN.) = 33.14  
 EFFECTIVE AREA(ACRES) = 1100.13 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 1104.8  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11920.00 = 12869.60 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11920.00 TO NODE 11921.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

\*\*\*\*\*  
 ELEVATION DATA: UPSTREAM(FEET) = 873.95 DOWNSTREAM(FEET) = 827.94  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1417.25 CHANNEL SLOPE = 0.0325  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 6.07  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.599

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 107.47 0.30 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1410.97  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.52  
 AVERAGE FLOW DEPTH(FEET) = 6.06 TRAVEL TIME(MIN.) = 2.25  
 Tc(MIN.) = 35.39  
 SUBAREA AREA(ACRES) = 107.47 SUBAREA RUNOFF(CFS) = 125.65  
 EFFECTIVE AREA(ACRES) = 1207.60 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 1212.3 PEAK FLOW RATE(CFS) = 1413.99  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 6.07

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 6.07 FLOW VELOCITY(FEET/SEC.) = 10.52  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11921.00 = 14286.85 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11921.00 TO NODE 11922.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

\*\*\*\*\*  
 ELEVATION DATA: UPSTREAM(FEET) = 827.94 DOWNSTREAM(FEET) = 753.55  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1886.43 CHANNEL SLOPE = 0.0394  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 6.18

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.527  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 344.27 0.30 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1604.04  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.68  
 AVERAGE FLOW DEPTH(FEET) = 6.15 TRAVEL TIME(MIN.) = 2.69  
 Tc(MIN.) = 38.08  
 SUBAREA AREA(ACRES) = 344.27 SUBAREA RUNOFF(CFS) = 380.08  
 EFFECTIVE AREA(ACRES) = 1551.87 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 1556.5 PEAK FLOW RATE(CFS) = 1715.40  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 6.35

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 6.35 FLOW VELOCITY(FEET/SEC.) = 11.89  
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11922.00 = 16173.28 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11922.00 TO NODE 11923.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 753.55 DOWNSTREAM(FEET) = 641.58  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2860.88 CHANNEL SLOPE = 0.0391  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.53  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.442

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	165.18	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1800.27  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.01  
AVERAGE FLOW DEPTH(FEET) = 6.51 TRAVEL TIME(MIN.) = 3.97  
Tc(MIN.) = 42.05

SUBAREA AREA(ACRES) = 165.18 SUBAREA RUNOFF(CFS) = 169.74  
EFFECTIVE AREA(ACRES) = 1717.05 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1721.7 PEAK FLOW RATE(CFS) = 1766.60  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.46

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 6.46 FLOW VELOCITY(FEET/SEC.) = 11.94  
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11923.00 = 19034.16 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11923.00 TO NODE 11924.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 641.58 DOWNSTREAM(FEET) = 579.89  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1844.02 CHANNEL SLOPE = 0.0335  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.08  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.399

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	433.73	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1981.09

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.61  
AVERAGE FLOW DEPTH(FEET) = 7.07 TRAVEL TIME(MIN.) = 2.65  
Tc(MIN.) = 44.70  
SUBAREA AREA(ACRES) = 433.73 SUBAREA RUNOFF(CFS) = 428.97  
EFFECTIVE AREA(ACRES) = 2150.78 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 2155.4 PEAK FLOW RATE(CFS) = 2129.29  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.31

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 7.31 FLOW VELOCITY(FEET/SEC.) = 11.83  
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11924.00 = 20878.18 FEET.

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FLOW PROCESS FROM NODE 11924.00 TO NODE 11925.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 579.89 DOWNSTREAM(FEET) = 494.12  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2756.15 CHANNEL SLOPE = 0.0311  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.65  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.335

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	265.42	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2252.94  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.68  
AVERAGE FLOW DEPTH(FEET) = 7.63 TRAVEL TIME(MIN.) = 3.93  
Tc(MIN.) = 48.63

SUBAREA AREA(ACRES) = 265.42 SUBAREA RUNOFF(CFS) = 247.29  
EFFECTIVE AREA(ACRES) = 2416.20 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 2420.9 PEAK FLOW RATE(CFS) = 2253.25  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.63

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 7.63 FLOW VELOCITY(FEET/SEC.) = 11.68  
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11925.00 = 23634.33 FEET.

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FLOW PROCESS FROM NODE 11925.00 TO NODE 11926.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 494.12 DOWNSTREAM(FEET) = 458.40  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1922.70 CHANNEL SLOPE = 0.0186  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 8.68  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.294  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 97.46 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2296.83  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.69  
 AVERAGE FLOW DEPTH(FEET) = 8.67 TRAVEL TIME(MIN.) = 3.31  
 Tc(MIN.) = 51.94  
 SUBAREA AREA(ACRES) = 97.46 SUBAREA RUNOFF(CFS) = 87.17  
 EFFECTIVE AREA(ACRES) = 2513.66 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 2518.3 PEAK FLOW RATE(CFS) = 2253.25  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 8.60

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 8.60 FLOW VELOCITY(FEET/SEC.) = 9.64  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11926.00 = 25557.03 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11926.00 TO NODE 11927.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 458.40 DOWNSTREAM(FEET) = 399.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2170.13 CHANNEL SLOPE = 0.0274  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 7.90  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.262  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 53.83 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2276.54  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.17  
 AVERAGE FLOW DEPTH(FEET) = 7.90 TRAVEL TIME(MIN.) = 3.24  
 Tc(MIN.) = 55.18  
 SUBAREA AREA(ACRES) = 53.83 SUBAREA RUNOFF(CFS) = 46.60  
 EFFECTIVE AREA(ACRES) = 2567.49 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 2572.1 PEAK FLOW RATE(CFS) = 2253.25  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 7.86

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 7.86 FLOW VELOCITY(FEET/SEC.) = 11.14  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11927.00 = 27727.16 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11927.00 TO NODE 11927.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 1 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: 0610401X.DNA  
 MEMORY BANK # 1 DEFINED AS FOLLOWS:  
 STREAM Q Tc Fp(Fm) Ap Ae HEADWATER  
 NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE  
 1 984.21 24.40 0.30( 0.30) 1.00 621.3 40120.00  
 2 973.39 26.21 0.30( 0.30) 1.00 652.1 40100.00  
 TOTAL AREA(ACRES) = 652.1

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11927.00 TO NODE 11927.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2253.25	55.18	1.262	0.30( 0.30)	1.00	2567.5	11900.00
2	2248.71	55.45	1.259	0.30( 0.30)	1.00	2572.1	11910.00

LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11927.00 = 27727.16 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	984.21	24.40	1.975	0.30( 0.30)	1.00	621.3	40120.00
2	973.39	26.21	1.891	0.30( 0.30)	1.00	652.1	40100.00

LONGEST FLOWPATH FROM NODE 40100.00 TO NODE 11927.00 = 10245.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2718.74	24.40	1.975	0.30( 0.30)	1.00	1756.5	40120.00
2	2743.23	26.21	1.891	0.30( 0.30)	1.00	1871.4	40100.00
3	2841.58	55.18	1.262	0.30( 0.30)	1.00	3219.6	11900.00
4	2835.43	55.45	1.259	0.30( 0.30)	1.00	3224.2	11910.00

TOTAL AREA(ACRES) = 3224.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 2841.58 Tc(MIN.) = 55.180  
 EFFECTIVE AREA(ACRES) = 3219.56 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 3224.2  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11927.00 = 27727.16 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11927.00 TO NODE 11927.50 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 399.00 DOWNSTREAM(FEET) = 384.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 986.26 CHANNEL SLOPE = 0.0152  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 9.99  
 CHANNEL FLOW THRU SUBAREA(CFS) = 2841.58  
 FLOW VELOCITY(FEET/SEC.) = 9.49 FLOW DEPTH(FEET) = 9.99  
 TRAVEL TIME(MIN.) = 1.73 Tc(MIN.) = 56.91  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11927.50 = 28713.42 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11927.50 TO NODE 11927.50 IS CODE = 12  
 -----

>>>>CLEAR MEMORY BANK # 1 <<<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11927.50 TO NODE 11927.50 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 1 <<<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610402X.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	79.39	13.47	0.30 ( 0.30)	1.00	33.3	40200.00
TOTAL AREA (ACRES) = 33.3						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11927.50 TO NODE 11927.50 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2718.74	26.15	1.893	0.30 ( 0.30)	1.00	1756.5	40120.00
2	2743.23	27.95	1.823	0.30 ( 0.30)	1.00	1871.4	40100.00
3	2841.58	56.91	1.245	0.30 ( 0.30)	1.00	3219.6	11900.00
4	2835.43	57.18	1.242	0.30 ( 0.30)	1.00	3224.2	11910.00
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11927.50 = 28713.42 FEET.							

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	79.39	13.47	2.949	0.30 ( 0.30)	1.00	33.3	40200.00
LONGEST FLOWPATH FROM NODE 40200.00 TO NODE 11927.50 = 1999.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2407.13	13.47	2.949	0.30 ( 0.30)	1.00	938.2	40200.00
2	2766.51	26.15	1.893	0.30 ( 0.30)	1.00	1789.8	40120.00
3	2788.89	27.95	1.823	0.30 ( 0.30)	1.00	1904.7	40100.00
4	2869.89	56.91	1.245	0.30 ( 0.30)	1.00	3252.9	11900.00
5	2863.66	57.18	1.242	0.30 ( 0.30)	1.00	3257.5	11910.00
TOTAL AREA (ACRES) = 3257.5							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 2869.89 Tc(MIN.) = 56.913  
 EFFECTIVE AREA(ACRES) = 3252.87 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 3257.5  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11927.50 = 28713.42 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11927.50 TO NODE 11928.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 384.00 DOWNSTREAM(FEET) = 359.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 647.19 CHANNEL SLOPE = 0.0386  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 8.17  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.237

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	78.01	0.30	0.984	-

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.984

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2902.94

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.50

AVERAGE FLOW DEPTH(FEET) = 8.17 TRAVEL TIME(MIN.) = 0.80

Tc(MIN.) = 57.71

SUBAREA AREA(ACRES) = 78.01 SUBAREA RUNOFF(CFS) = 66.10

EFFECTIVE AREA(ACRES) = 3330.88 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 3335.5 PEAK FLOW RATE(CFS) = 2869.89

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.12

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.12 FLOW VELOCITY(FEET/SEC.) = 13.47

LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11928.00 = 29360.61 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11928.00 TO NODE 11929.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 359.00 DOWNSTREAM(FEET) = 341.63  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1322.66 CHANNEL SLOPE = 0.0131  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 10.37  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.213

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	78.01	0.30	0.984	-

USER-DEFINED - 8.18 0.30 0.890 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.890  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2873.37  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.01  
 AVERAGE FLOW DEPTH (FEET) = 10.37 TRAVEL TIME (MIN.) = 2.45  
 Tc (MIN.) = 60.16  
 SUBAREA AREA (ACRES) = 8.18 SUBAREA RUNOFF (CFS) = 6.96  
 EFFECTIVE AREA (ACRES) = 3339.06 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 3343.7 PEAK FLOW RATE (CFS) = 2869.89  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 10.37

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 10.37 FLOW VELOCITY (FEET/SEC.) = 9.01  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11929.00 = 30683.27 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11928.00 TO NODE 11929.00 IS CODE = 10  
 -----  
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11841.00 TO NODE 11527.00 IS CODE = 12  
 -----  
 >>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11841.00 TO NODE 12527.00 IS CODE = 15.1  
 -----  
 >>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S18.DNA  
 MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	18857.19	37.78	0.30 (0.30)	1.00	7696.9	11831.00
2	19164.00	40.18	0.30 (0.30)	1.00	8206.2	11801.00
3	20857.89	51.52	0.30 (0.30)	1.00	11175.6	11530.00
4	21733.29	56.15	0.30 (0.30)	1.00	12835.7	11701.00
5	22200.08	58.56	0.30 (0.30)	1.00	13761.3	11000.00
6	24571.06	68.38	0.30 (0.30)	1.00	18741.8	11330.00
7	24991.82	70.58	0.30 (0.30)	1.00	19901.5	10800.00
8	25613.65	74.96	0.30 (0.30)	1.00	22210.7	11130.00
9	25454.36	83.56	0.30 (0.30)	1.00	25309.0	11620.00
10	25384.82	85.79	0.30 (0.30)	1.00	26059.2	11600.00
11	25264.75	87.44	0.30 (0.30)	1.00	26526.0	10600.00
12	25051.43	92.79	0.30 (0.30)	1.00	28070.3	11201.00
13	24727.44	98.42	0.30 (0.30)	1.00	29254.1	10710.00
14	24566.31	100.41	0.30 (0.30)	1.00	29586.2	10410.00
15	24072.02	105.10	0.30 (0.30)	1.00	30247.2	10700.00
16	23355.07	112.09	0.30 (0.30)	1.00	31166.3	10400.00
17	23164.74	114.41	0.30 (0.30)	1.00	31436.1	10200.00

18 22543.01 120.36 0.30 (0.30) 1.00 32015.3 10300.00  
 19 21907.27 125.43 0.30 (0.30) 1.00 32220.0 10210.00  
 20 19361.93 152.56 0.30 (0.30) 1.00 32916.6 10100.00  
 TOTAL AREA (ACRES) = 32916.6

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 12  
 -----

>>>>CLEAR MEMORY BANK # 2 <<<<<

\*\*\*\*\*MEMORY BANK # 2 IS EMPTY - PROCESS IGNORED.\*\*\*

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S25.DNA  
 MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6814.50	66.89	0.30 (0.30)	0.99	6391.3	12500.00
2	7516.29	80.52	0.30 (0.30)	0.99	8363.2	12300.00
3	7624.15	81.90	0.30 (0.30)	0.98	8651.1	12330.00
4	7790.13	84.56	0.30 (0.30)	0.98	9163.3	12410.00
5	7994.80	88.76	0.30 (0.29)	0.98	9893.7	12400.00
6	8150.71	93.51	0.30 (0.29)	0.98	10583.9	12211.00
7	8243.64	97.69	0.30 (0.29)	0.98	11179.7	12201.00
8	8206.30	101.91	0.30 (0.29)	0.98	11654.2	12111.00
9	8181.35	104.55	0.30 (0.29)	0.98	11966.0	12231.00
10	8146.02	107.37	0.30 (0.29)	0.98	12265.8	12101.10
11	8126.24	108.35	0.30 (0.29)	0.98	12357.5	12261.00
12	7677.07	119.73	0.30 (0.29)	0.98	13113.0	12010.00
13	7237.60	128.31	0.30 (0.29)	0.98	13237.1	12000.00

TOTAL AREA (ACRES) = 13237.1

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 FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 14.0  
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>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6814.50	66.89	0.30 (0.30)	0.99	6391.3	12500.00
2	7516.29	80.52	0.30 (0.30)	0.99	8363.2	12300.00
3	7624.15	81.90	0.30 (0.30)	0.98	8651.1	12330.00
4	7790.13	84.56	0.30 (0.30)	0.98	9163.3	12410.00
5	7994.80	88.76	0.30 (0.29)	0.98	9893.7	12400.00
6	8150.71	93.51	0.30 (0.29)	0.98	10583.9	12211.00
7	8243.64	97.69	0.30 (0.29)	0.98	11179.7	12201.00
8	8206.30	101.91	0.30 (0.29)	0.98	11654.2	12111.00
9	8181.35	104.55	0.30 (0.29)	0.98	11966.0	12231.00
10	8146.02	107.37	0.30 (0.29)	0.98	12265.8	12101.10
11	8126.24	108.35	0.30 (0.29)	0.98	12357.5	12261.00
12	7677.07	119.73	0.30 (0.29)	0.98	13113.0	12010.00
13	7237.60	128.31	0.30 (0.29)	0.98	13237.1	12000.00



TOTAL AREA(ACRES) = 13237.1

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FLOW PROCESS FROM NODE 11841.00 TO NODE 12527.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6814.50	66.89	1.167	0.30( 0.30)	0.99	6391.3	12500.00
2	7516.29	80.52	1.074	0.30( 0.30)	0.99	8363.2	12300.00
3	7624.15	81.90	1.065	0.30( 0.30)	0.98	8651.1	12330.00
4	7790.13	84.56	1.047	0.30( 0.30)	0.98	9163.3	12410.00
5	7994.80	88.76	1.018	0.30( 0.29)	0.98	9893.7	12400.00
6	8150.71	93.51	0.995	0.30( 0.29)	0.98	10583.9	12211.00
7	8243.64	97.69	0.977	0.30( 0.29)	0.98	11179.7	12201.00
8	8206.30	101.91	0.958	0.30( 0.29)	0.98	11654.2	12111.00
9	8181.35	104.55	0.947	0.30( 0.29)	0.98	11966.0	12231.00
10	8146.02	107.37	0.935	0.30( 0.29)	0.98	12265.8	12101.10
11	8126.24	108.35	0.930	0.30( 0.29)	0.98	12357.5	12261.00
12	7677.07	119.73	0.881	0.30( 0.29)	0.98	13113.0	12010.00
13	7237.60	128.31	0.863	0.30( 0.29)	0.98	13237.1	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12527.00 = 77156.98 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	18857.19	37.78	1.535	0.30( 0.30)	1.00	7696.9	11831.00
2	19164.00	40.18	1.472	0.30( 0.30)	1.00	8206.2	11801.00
3	20857.89	51.52	1.298	0.30( 0.30)	1.00	11175.6	11530.00
4	21733.29	56.15	1.252	0.30( 0.30)	1.00	12835.7	11701.00
5	22200.08	58.56	1.228	0.30( 0.30)	1.00	13761.3	11000.00
6	24571.06	68.38	1.157	0.30( 0.30)	1.00	18741.8	11330.00
7	24991.82	70.58	1.142	0.30( 0.30)	1.00	19901.5	10800.00
8	25613.65	74.96	1.112	0.30( 0.30)	1.00	22210.7	11130.00
9	25454.36	83.56	1.054	0.30( 0.30)	1.00	25309.0	11620.00
10	25384.82	85.79	1.039	0.30( 0.30)	1.00	26059.2	11600.00
11	25264.75	87.44	1.027	0.30( 0.30)	1.00	26526.0	10600.00
12	25051.43	92.79	0.998	0.30( 0.30)	1.00	28070.3	11201.00
13	24727.44	98.42	0.974	0.30( 0.30)	1.00	29254.1	10710.00
14	24566.31	100.41	0.965	0.30( 0.30)	1.00	29586.2	10410.00
15	24072.02	105.10	0.945	0.30( 0.30)	1.00	30247.2	10700.00
16	23355.07	112.09	0.914	0.30( 0.30)	1.00	31166.3	10400.00
17	23164.74	114.41	0.904	0.30( 0.30)	1.00	31436.1	10200.00
18	22543.01	120.36	0.879	0.30( 0.30)	1.00	32015.3	10300.00
19	21907.27	125.43	0.869	0.30( 0.30)	1.00	32220.0	10210.00
20	19361.93	152.56	0.815	0.30( 0.30)	1.00	32916.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24329.79	37.78	1.535	0.30( 0.30)	0.99	11306.6	11831.00
2	24690.32	40.18	1.472	0.30( 0.30)	0.99	12045.7	11801.00
3	26894.55	51.52	1.298	0.30( 0.30)	0.99	16098.3	11530.00
4	28011.54	56.15	1.252	0.30( 0.30)	0.99	18200.8	11701.00

5	28584.42	58.56	1.228	0.30( 0.30)	0.99	19356.8	11000.00
6	31026.95	66.89	1.167	0.30( 0.30)	0.99	24379.8	12500.00
7	31462.02	68.38	1.157	0.30( 0.30)	0.99	25347.9	11330.00
8	31996.52	70.58	1.142	0.30( 0.30)	0.99	26827.2	10800.00
9	32843.79	74.96	1.112	0.30( 0.30)	0.99	29769.9	11130.00
10	33027.03	80.52	1.074	0.30( 0.30)	0.99	32575.4	12300.00
11	33109.33	81.90	1.065	0.30( 0.30)	0.99	33360.6	12330.00
12	33182.19	83.56	1.054	0.30( 0.30)	0.99	34280.0	11620.00
13	33213.31	84.56	1.047	0.30( 0.30)	0.99	34808.6	12410.00
14	33234.97	85.79	1.039	0.30( 0.30)	0.99	35436.7	11600.00
15	33195.18	87.44	1.027	0.30( 0.30)	0.99	36190.1	10600.00
16	33206.99	88.76	1.018	0.30( 0.30)	0.99	36800.3	12400.00
17	33178.75	92.79	0.998	0.30( 0.30)	0.99	38550.8	11201.00
18	33161.16	93.51	0.995	0.30( 0.30)	0.99	38803.9	12211.00
19	33013.05	97.69	0.977	0.30( 0.30)	0.99	40280.5	12201.00
20	32964.63	98.42	0.974	0.30( 0.30)	0.99	40515.8	10710.00
21	32785.95	100.41	0.965	0.30( 0.30)	0.99	41071.0	10410.00
22	32613.72	101.91	0.958	0.30( 0.30)	0.99	41452.9	12111.00
23	32311.17	104.55	0.947	0.30( 0.30)	0.99	42135.8	12231.00
24	32246.51	105.10	0.945	0.30( 0.30)	0.99	42271.3	10700.00
25	31984.73	107.37	0.935	0.30( 0.30)	0.99	42812.1	12101.10
26	31865.02	108.35	0.930	0.30( 0.30)	0.99	43031.8	12261.00
27	31333.58	112.09	0.914	0.30( 0.30)	0.99	43772.2	10400.00
28	31051.69	114.41	0.904	0.30( 0.30)	0.99	44196.0	10200.00
29	30286.21	119.73	0.881	0.30( 0.30)	0.99	45066.8	12010.00
30	30187.65	120.36	0.879	0.30( 0.30)	0.99	45137.5	10300.00
31	29292.29	125.43	0.869	0.30( 0.30)	0.99	45415.5	10210.00
32	28874.95	128.31	0.863	0.30( 0.30)	0.99	45530.9	12000.00
33	25983.19	152.56	0.815	0.30( 0.30)	0.99	46153.7	10100.00

TOTAL AREA(ACRES) = 46153.7

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 33234.97 Tc(MIN.) = 85.793  
EFFECTIVE AREA(ACRES) = 35436.66 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 46153.7  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

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FLOW PROCESS FROM NODE 12527.00 TO NODE 11929.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 347.47 DOWNSTREAM(FEET) = 341.63  
CHANNEL LENGTH THRU SUBAREA(FEET) = 532.38 CHANNEL SLOPE = 0.0110  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT(FEET) = 9.03  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.035

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	14.37	0.30	0.987	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.987

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 33239.75

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.01

AVERAGE FLOW DEPTH (FEET) = 9.03 TRAVEL TIME (MIN.) = 0.59  
 Tc (MIN.) = 86.38  
 SUBAREA AREA (ACRES) = 14.37 SUBAREA RUNOFF (CFS) = 9.55  
 EFFECTIVE AREA (ACRES) = 35451.04 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 46168.0 PEAK FLOW RATE (CFS) = 33234.97  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 9.03

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 9.03 FLOW VELOCITY (FEET/SEC.) = 15.01  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

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FLOW PROCESS FROM NODE 11928.00 TO NODE 11929.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24329.79	38.43	1.517	0.30 ( 0.30)	0.99	11320.9	11831.00
2	24690.32	40.84	1.461	0.30 ( 0.30)	0.99	12060.1	11801.00
3	26894.55	52.15	1.292	0.30 ( 0.30)	0.99	16112.6	11530.00
4	28011.54	56.78	1.246	0.30 ( 0.30)	0.99	18215.2	11701.00
5	28584.42	59.18	1.222	0.30 ( 0.30)	0.99	19371.1	11000.00
6	31026.95	67.50	1.163	0.30 ( 0.30)	0.99	24394.2	12500.00
7	31462.02	68.98	1.153	0.30 ( 0.30)	0.99	25362.3	11330.00
8	31996.52	71.18	1.138	0.30 ( 0.30)	0.99	26841.5	10800.00
9	32843.79	75.55	1.108	0.30 ( 0.30)	0.99	29784.3	11130.00
10	33027.03	81.11	1.070	0.30 ( 0.30)	0.99	32589.8	12300.00
11	33109.33	82.49	1.061	0.30 ( 0.30)	0.99	33374.9	12330.00
12	33182.19	84.15	1.050	0.30 ( 0.30)	0.99	34294.4	11620.00
13	33213.31	85.15	1.043	0.30 ( 0.30)	0.99	34823.0	12410.00
14	33234.97	86.38	1.035	0.30 ( 0.30)	0.99	35451.0	11600.00
15	33195.18	88.03	1.023	0.30 ( 0.30)	0.99	36204.4	10600.00
16	33206.99	89.35	1.014	0.30 ( 0.30)	0.99	36814.7	12400.00
17	33178.75	93.38	0.995	0.30 ( 0.30)	0.99	38565.1	11201.00
18	33161.16	94.10	0.992	0.30 ( 0.30)	0.99	38818.3	12211.00
19	33013.05	98.29	0.974	0.30 ( 0.30)	0.99	40294.8	12201.00
20	32964.63	99.02	0.971	0.30 ( 0.30)	0.99	40530.1	10710.00
21	32785.95	101.00	0.962	0.30 ( 0.30)	0.99	41085.3	10410.00
22	32613.72	102.51	0.956	0.30 ( 0.30)	0.99	41467.2	12111.00
23	32311.17	105.14	0.944	0.30 ( 0.30)	0.99	42150.2	12231.00
24	32246.51	105.69	0.942	0.30 ( 0.30)	0.99	42285.7	10700.00
25	31984.73	107.97	0.932	0.30 ( 0.30)	0.99	42826.5	12101.10
26	31865.02	108.95	0.928	0.30 ( 0.30)	0.99	43046.2	12261.00
27	31333.58	112.69	0.912	0.30 ( 0.30)	0.99	43786.6	10400.00
28	31051.69	115.02	0.902	0.30 ( 0.30)	0.99	44210.4	10200.00
29	30286.21	120.34	0.879	0.30 ( 0.30)	0.99	45081.1	12010.00
30	30187.65	120.97	0.878	0.30 ( 0.30)	0.99	45151.9	10300.00
31	29292.29	126.05	0.868	0.30 ( 0.30)	0.99	45429.8	10210.00
32	28874.95	128.93	0.862	0.30 ( 0.30)	0.99	45545.3	12000.00
33	25983.19	153.21	0.814	0.30 ( 0.30)	0.99	46168.0	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2407.13	16.86	2.527	0.30 ( 0.30)	1.00	1024.4	40200.00
2	2766.51	29.42	1.766	0.30 ( 0.30)	1.00	1876.0	40120.00
3	2788.89	31.22	1.711	0.30 ( 0.30)	1.00	1990.9	40100.00
4	2869.89	60.16	1.213	0.30 ( 0.30)	1.00	3339.1	11900.00
5	2863.66	60.43	1.211	0.30 ( 0.30)	1.00	3343.7	11910.00

LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11929.00 = 30683.27 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21915.10	16.86	2.527	0.30 ( 0.30)	0.99	5989.8	40200.00
2	25199.21	29.42	1.766	0.30 ( 0.30)	0.99	10542.6	40120.00
3	25697.26	31.22	1.711	0.30 ( 0.30)	0.99	11187.2	40100.00
4	27138.87	38.43	1.517	0.30 ( 0.30)	0.99	13647.9	11831.00
5	27506.13	40.84	1.461	0.30 ( 0.30)	0.99	14499.0	11801.00
6	29742.04	52.15	1.292	0.30 ( 0.30)	0.99	19078.8	11530.00
7	30871.96	56.78	1.246	0.30 ( 0.30)	0.99	21396.8	11701.00
8	31451.58	59.18	1.222	0.30 ( 0.30)	0.99	22664.8	11000.00
9	31740.97	60.16	1.213	0.30 ( 0.30)	0.99	23299.7	11900.00
10	31813.21	60.43	1.211	0.30 ( 0.30)	0.99	23465.7	11910.00
11	33739.66	67.50	1.163	0.30 ( 0.30)	0.99	27737.9	12500.00
12	34143.09	68.98	1.153	0.30 ( 0.30)	0.99	28706.0	11330.00
13	34630.52	71.18	1.138	0.30 ( 0.30)	0.99	30185.2	10800.00
14	35384.44	75.55	1.108	0.30 ( 0.30)	0.99	33128.0	11130.00
15	35449.07	81.11	1.070	0.30 ( 0.30)	0.99	35933.5	12300.00
16	35501.91	82.49	1.061	0.30 ( 0.30)	0.99	36718.7	12330.00
17	35539.25	84.15	1.050	0.30 ( 0.30)	0.99	37638.1	11620.00
18	35549.02	85.15	1.043	0.30 ( 0.30)	0.99	38166.7	12410.00
19	35544.41	86.38	1.035	0.30 ( 0.30)	0.99	38794.8	11600.00
20	35469.49	88.03	1.023	0.30 ( 0.30)	0.99	39548.1	10600.00
21	35453.12	89.35	1.014	0.30 ( 0.30)	0.99	40158.4	12400.00
22	35364.94	93.38	0.995	0.30 ( 0.30)	0.99	41908.8	11201.00
23	35337.66	94.10	0.992	0.30 ( 0.30)	0.99	42162.0	12211.00
24	35132.55	98.29	0.974	0.30 ( 0.30)	0.99	43638.6	12201.00
25	35074.21	99.02	0.971	0.30 ( 0.30)	0.99	43873.9	10710.00
26	34868.52	101.00	0.962	0.30 ( 0.30)	0.99	44429.0	10410.00
27	34675.77	102.51	0.956	0.30 ( 0.30)	0.99	44811.0	12111.00
28	34337.37	105.14	0.944	0.30 ( 0.30)	0.99	45493.9	12231.00
29	34265.25	105.69	0.942	0.30 ( 0.30)	0.99	45629.4	10700.00
30	33972.47	107.97	0.932	0.30 ( 0.30)	0.99	46170.2	12101.10
31	33839.48	108.95	0.928	0.30 ( 0.30)	0.99	46389.9	12261.00
32	33257.06	112.69	0.912	0.30 ( 0.30)	0.99	47130.3	10400.00
33	32943.58	115.02	0.902	0.30 ( 0.30)	0.99	47554.1	10200.00
34	32108.15	120.34	0.879	0.30 ( 0.30)	0.99	48424.9	12010.00
35	32005.61	120.97	0.878	0.30 ( 0.30)	0.99	48495.6	10300.00
36	31078.39	126.05	0.868	0.30 ( 0.30)	0.99	48773.5	10210.00
37	30642.96	128.93	0.862	0.30 ( 0.30)	0.99	48889.0	12000.00
38	27598.74	153.21	0.814	0.30 ( 0.30)	0.99	49511.8	10100.00

TOTAL AREA (ACRES) = 49511.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 35549.02 Tc (MIN.) = 85.154  
 EFFECTIVE AREA (ACRES) = 38166.73 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99

TOTAL AREA(ACRES) = 49511.8  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 49511.8 TC(MIN.) = 85.15  
EFFECTIVE AREA(ACRES) = 38166.73 AREA-AVERAGED Fm(INCH/HR)= 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.994  
PEAK FLOW RATE(CFS) = 35549.02

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21915.10	16.86	2.527	0.30( 0.30)	0.99	5989.8	40200.00
2	25199.21	29.42	1.766	0.30( 0.30)	0.99	10542.6	40120.00
3	25697.26	31.22	1.711	0.30( 0.30)	0.99	11187.2	40100.00
4	27138.87	38.43	1.517	0.30( 0.30)	0.99	13647.9	11831.00
5	27506.13	40.84	1.461	0.30( 0.30)	0.99	14499.0	11801.00
6	29742.04	52.15	1.292	0.30( 0.30)	0.99	19078.8	11530.00
7	30871.96	56.78	1.246	0.30( 0.30)	0.99	21396.8	11701.00
8	31451.58	59.18	1.222	0.30( 0.30)	0.99	22664.8	11000.00
9	31740.97	60.16	1.213	0.30( 0.30)	0.99	23299.7	11900.00
10	31813.21	60.43	1.211	0.30( 0.30)	0.99	23465.7	11910.00
11	33739.66	67.50	1.163	0.30( 0.30)	0.99	27737.9	12500.00
12	34143.09	68.98	1.153	0.30( 0.30)	0.99	28706.0	11330.00
13	34630.52	71.18	1.138	0.30( 0.30)	0.99	30185.2	10800.00
14	35384.44	75.55	1.108	0.30( 0.30)	0.99	33128.0	11130.00
15	35449.07	81.11	1.070	0.30( 0.30)	0.99	35933.5	12300.00
16	35501.91	82.49	1.061	0.30( 0.30)	0.99	36718.7	12330.00
17	35539.25	84.15	1.050	0.30( 0.30)	0.99	37638.1	11620.00
18	35549.02	85.15	1.043	0.30( 0.30)	0.99	38166.7	12410.00
19	35544.41	86.38	1.035	0.30( 0.30)	0.99	38794.8	11600.00
20	35469.49	88.03	1.023	0.30( 0.30)	0.99	39548.1	10600.00
21	35453.12	89.35	1.014	0.30( 0.30)	0.99	40158.4	12400.00
22	35364.94	93.38	0.995	0.30( 0.30)	0.99	41908.8	11201.00
23	35337.66	94.10	0.992	0.30( 0.30)	0.99	42162.0	12211.00
24	35132.55	98.29	0.974	0.30( 0.30)	0.99	43638.6	12201.00
25	35074.21	99.02	0.971	0.30( 0.30)	0.99	43873.9	10710.00
26	34868.52	101.00	0.962	0.30( 0.30)	0.99	44429.0	10410.00
27	34675.77	102.51	0.956	0.30( 0.30)	0.99	44811.0	12111.00
28	34337.37	105.14	0.944	0.30( 0.30)	0.99	45493.9	12231.00
29	34265.25	105.69	0.942	0.30( 0.30)	0.99	45629.4	10700.00
30	33972.47	107.97	0.932	0.30( 0.30)	0.99	46170.2	12101.10
31	33839.48	108.95	0.928	0.30( 0.30)	0.99	46389.9	12261.00
32	33257.06	112.69	0.912	0.30( 0.30)	0.99	47130.3	10400.00
33	32943.58	115.02	0.902	0.30( 0.30)	0.99	47554.1	10200.00
34	32108.15	120.34	0.879	0.30( 0.30)	0.99	48424.9	12010.00
35	32005.61	120.97	0.878	0.30( 0.30)	0.99	48495.6	10300.00
36	31078.39	126.05	0.868	0.30( 0.30)	0.99	48773.5	10210.00
37	30642.96	128.93	0.862	0.30( 0.30)	0.99	48889.0	12000.00
38	27598.74	153.21	0.814	0.30( 0.30)	0.99	49511.8	10100.00

=====  
END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

-----  
FILE NAME: S20.DAT  
TIME/DATE OF STUDY: 11:58 04/03/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.059
- 2) 10.00; 3.304
- 3) 15.00; 2.561
- 4) 20.00; 2.152
- 5) 25.00; 1.872
- 6) 30.00; 1.681
- 7) 40.00; 1.428
- 8) 50.00; 1.266
- 9) 60.00; 1.147
- 10) 90.00; 0.946
- 11) 120.00; 0.816
- 12) 180.00; 0.687
- 13) 360.00; 0.499
- 14) 1440.00; 0.216

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	STREETS FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12000.00 TO NODE 12001.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 965.01  
ELEVATION DATA: UPSTREAM(FEET) = 4506.20 DOWNSTREAM(FEET) = 4179.61

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.700  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.754

SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)

NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 9.03 0.30 1.000 0 13.70  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 19.95  
TOTAL AREA(ACRES) = 9.03 PEAK FLOW RATE(CFS) = 19.95

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12001.00 TO NODE 12002.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 4179.61 DOWNSTREAM(FEET) = 3849.51  
CHANNEL LENGTH THRU SUBAREA(FEET) = 976.60 CHANNEL SLOPE = 0.3380  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.46  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.499

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN

USER-DEFINED - 18.82 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 38.60  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.92  
AVERAGE FLOW DEPTH(FEET) = 0.45 TRAVEL TIME(MIN.) = 2.05  
Tc(MIN.) = 15.76

SUBAREA AREA(ACRES) = 18.82 SUBAREA RUNOFF(CFS) = 37.25  
EFFECTIVE AREA(ACRES) = 27.85 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 27.8 PEAK FLOW RATE(CFS) = 55.13  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.55

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.55 FLOW VELOCITY(FEET/SEC.) = 8.99  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12002.00 = 1941.61 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12002.00 TO NODE 12003.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3849.51 DOWNSTREAM(FEET) = 3265.69  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1892.03 CHANNEL SLOPE = 0.3086  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.91  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.270  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	68.96	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 116.39  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.24  
AVERAGE FLOW DEPTH(FEET) = 0.88 TRAVEL TIME(MIN.) = 2.80  
Tc(MIN.) = 18.56  
SUBAREA AREA(ACRES) = 68.96 SUBAREA RUNOFF(CFS) = 122.26  
EFFECTIVE AREA(ACRES) = 96.81 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 96.8 PEAK FLOW RATE(CFS) = 171.63  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.10

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.10 FLOW VELOCITY(FEET/SEC.) = 12.85  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12003.00 = 3833.64 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12003.00 TO NODE 12020.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3265.69 DOWNSTREAM(FEET) = 2427.28  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3118.62 CHANNEL SLOPE = 0.2688  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.99  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.054  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	328.28	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 431.32  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.25  
AVERAGE FLOW DEPTH(FEET) = 1.92 TRAVEL TIME(MIN.) = 3.20  
Tc(MIN.) = 21.76  
SUBAREA AREA(ACRES) = 328.28 SUBAREA RUNOFF(CFS) = 518.12  
EFFECTIVE AREA(ACRES) = 425.09 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 425.1 PEAK FLOW RATE(CFS) = 670.91

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.44

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.44 FLOW VELOCITY(FEET/SEC.) = 18.51  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12020.00 = 6952.26 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12003.00 TO NODE 12020.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 21.76  
RAINFALL INTENSITY(INCH/HR) = 2.05  
AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 425.09  
TOTAL STREAM AREA(ACRES) = 425.09  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 670.91

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12010.00 TO NODE 12011.00 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 264.80  
ELEVATION DATA: UPSTREAM(FEET) = 4208.12 DOWNSTREAM(FEET) = 4068.13

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.470  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 4.192  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	-	2.06	0.30	1.000	0	7.47

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 7.22  
TOTAL AREA(ACRES) = 2.06 PEAK FLOW RATE(CFS) = 7.22

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12011.00 TO NODE 12012.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 4068.13 DOWNSTREAM(FEET) = 3694.92  
CHANNEL LENGTH THRU SUBAREA(FEET) = 654.45 CHANNEL SLOPE = 0.5703  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.21  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.581

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	3.98	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 13.12  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.27  
AVERAGE FLOW DEPTH(FEET) = 0.20 TRAVEL TIME(MIN.) = 1.74  
Tc(MIN.) = 9.21  
SUBAREA AREA(ACRES) = 3.98 SUBAREA RUNOFF(CFS) = 11.75  
EFFECTIVE AREA(ACRES) = 6.04 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 6.0 PEAK FLOW RATE(CFS) = 17.84  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.24

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.24 FLOW VELOCITY(FEET/SEC.) = 7.05  
LONGEST FLOWPATH FROM NODE 12010.00 TO NODE 12012.00 = 919.25 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12012.00 TO NODE 12013.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3694.92 DOWNSTREAM(FEET) = 3415.55  
CHANNEL LENGTH THRU SUBAREA(FEET) = 981.94 CHANNEL SLOPE = 0.2845  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.67  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.150  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	35.56	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 63.59  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.96  
AVERAGE FLOW DEPTH(FEET) = 0.63 TRAVEL TIME(MIN.) = 1.83  
Tc(MIN.) = 11.04  
SUBAREA AREA(ACRES) = 35.56 SUBAREA RUNOFF(CFS) = 91.21  
EFFECTIVE AREA(ACRES) = 41.60 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 41.6 PEAK FLOW RATE(CFS) = 106.70  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.86

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.86 FLOW VELOCITY(FEET/SEC.) = 10.62  
LONGEST FLOWPATH FROM NODE 12010.00 TO NODE 12013.00 = 1901.19 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12013.00 TO NODE 12014.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3415.55 DOWNSTREAM(FEET) = 2756.62  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1926.68 CHANNEL SLOPE = 0.3420  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.16  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.801  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	72.40	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 188.40  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.68  
AVERAGE FLOW DEPTH(FEET) = 1.12 TRAVEL TIME(MIN.) = 2.35  
Tc(MIN.) = 13.38  
SUBAREA AREA(ACRES) = 72.40 SUBAREA RUNOFF(CFS) = 162.98  
EFFECTIVE AREA(ACRES) = 114.00 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 114.0 PEAK FLOW RATE(CFS) = 256.62  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.34

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.34 FLOW VELOCITY(FEET/SEC.) = 15.10  
LONGEST FLOWPATH FROM NODE 12010.00 TO NODE 12014.00 = 3827.87 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12014.00 TO NODE 12020.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2756.62 DOWNSTREAM(FEET) = 2427.28  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1697.28 CHANNEL SLOPE = 0.1940  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.99  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.528  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	121.96	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 378.98  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.98  
AVERAGE FLOW DEPTH(FEET) = 1.95 TRAVEL TIME(MIN.) = 2.02  
Tc(MIN.) = 15.41  
SUBAREA AREA(ACRES) = 121.96 SUBAREA RUNOFF(CFS) = 244.52  
EFFECTIVE AREA(ACRES) = 235.96 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 236.0 PEAK FLOW RATE(CFS) = 473.09

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.20

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 2.20 FLOW VELOCITY (FEET/SEC.) = 14.92  
LONGEST FLOWPATH FROM NODE 12010.00 TO NODE 12020.00 = 5525.15 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12014.00 TO NODE 12020.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION (MIN.) = 15.41  
RAINFALL INTENSITY (INCH/HR) = 2.53  
AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA (ACRES) = 235.96  
TOTAL STREAM AREA (ACRES) = 235.96  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 473.09

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	670.91	21.76	2.054	0.30 (0.30)	1.00	425.1	12000.00
2	473.09	15.41	2.528	0.30 (0.30)	1.00	236.0	12010.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1076.64	15.41	2.528	0.30 (0.30)	1.00	537.0	12010.00
2	1043.33	21.76	2.054	0.30 (0.30)	1.00	661.0	12000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
PEAK FLOW RATE (CFS) = 1076.64 Tc (MIN.) = 15.41  
EFFECTIVE AREA (ACRES) = 536.99 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 661.0  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12020.00 = 6952.26 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12020.00 TO NODE 12021.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2427.28 DOWNSTREAM (FEET) = 2056.25  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2698.04 CHANNEL SLOPE = 0.1375  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 4.32

\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.322

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 376.13 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1419.18  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 17.89  
AVERAGE FLOW DEPTH (FEET) = 4.28 TRAVEL TIME (MIN.) = 2.51  
Tc (MIN.) = 17.92  
SUBAREA AREA (ACRES) = 376.13 SUBAREA RUNOFF (CFS) = 684.54  
EFFECTIVE AREA (ACRES) = 913.12 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 1037.2 PEAK FLOW RATE (CFS) = 1661.83  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 4.62

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 4.62 FLOW VELOCITY (FEET/SEC.) = 18.69  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12021.00 = 9650.30 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12021.00 TO NODE 12022.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2056.25 DOWNSTREAM (FEET) = 1864.68  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2552.86 CHANNEL SLOPE = 0.0750  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.83  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.116  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 347.45 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1945.81  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 15.58  
AVERAGE FLOW DEPTH (FEET) = 5.79 TRAVEL TIME (MIN.) = 2.73  
Tc (MIN.) = 20.65  
SUBAREA AREA (ACRES) = 347.45 SUBAREA RUNOFF (CFS) = 567.75  
EFFECTIVE AREA (ACRES) = 1260.57 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 1384.6 PEAK FLOW RATE (CFS) = 2059.82  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.95

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 5.95 FLOW VELOCITY (FEET/SEC.) = 15.82  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12022.00 = 12203.16 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12022.00 TO NODE 12023.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1864.68 DOWNSTREAM(FEET) = 1710.75
CHANNEL LENGTH THRU SUBAREA(FEET) = 1886.57 CHANNEL SLOPE = 0.0816
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.13
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.010

SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 280.70 0.30 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2275.90
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.74
AVERAGE FLOW DEPTH(FEET) = 6.12 TRAVEL TIME(MIN.) = 1.88
Tc(MIN.) = 22.53

SUBAREA AREA(ACRES) = 280.70 SUBAREA RUNOFF(CFS) = 432.10
EFFECTIVE AREA(ACRES) = 1541.27 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 1665.3 PEAK FLOW RATE(CFS) = 2372.58
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.24

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 6.24 FLOW VELOCITY(FEET/SEC.) = 16.92
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12023.00 = 14089.73 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 12023.00 TO NODE 12024.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1710.75 DOWNSTREAM(FEET) = 1672.60
CHANNEL LENGTH THRU SUBAREA(FEET) = 1944.87 CHANNEL SLOPE = 0.0196
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 9.01
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.844

SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 248.35 0.30 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2545.20
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.15
AVERAGE FLOW DEPTH(FEET) = 8.98 TRAVEL TIME(MIN.) = 3.19
Tc(MIN.) = 25.72

SUBAREA AREA(ACRES) = 248.35 SUBAREA RUNOFF(CFS) = 345.20
EFFECTIVE AREA(ACRES) = 1789.62 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1913.7 PEAK FLOW RATE(CFS) = 2487.49
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.88

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 8.88 FLOW VELOCITY(FEET/SEC.) = 10.08
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12024.00 = 16034.60 FEET.

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 1913.7 TC(MIN.) = 25.72
EFFECTIVE AREA(ACRES) = 1789.62 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.000
PEAK FLOW RATE(CFS) = 2487.49

\*\* PEAK FLOW RATE TABLE \*\*
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 2487.49 25.72 1.844 0.30( 0.30) 1.00 1789.6 12010.00
2 2275.95 32.36 1.621 0.30( 0.30) 1.00 1913.7 12000.00

END OF RATIONAL METHOD ANALYSIS



\*\*\*\*\*

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

Analysis prepared by:

-----  
FILE NAME: S21.DAT  
TIME/DATE OF STUDY: 11:58 04/03/2013  
=====

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-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.059
- 2) 10.00; 3.304
- 3) 15.00; 2.561
- 4) 20.00; 2.152
- 5) 25.00; 1.872
- 6) 30.00; 1.681
- 7) 40.00; 1.428
- 8) 50.00; 1.266
- 9) 60.00; 1.147
- 10) 90.00; 0.946
- 11) 120.00; 0.816
- 12) 180.00; 0.687
- 13) 360.00; 0.499
- 14) 1440.00; 0.216

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / OUT- / SIDE / SIDE / WAY	STREET-CROSSFALL: HEIGHT (FT)	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 12023.00 TO NODE 12024.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: S20.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2487.49	25.72	0.30 ( 0.30)	1.00	1789.6	12010.00
2	2275.95	32.36	0.30 ( 0.30)	1.00	1913.7	12000.00
TOTAL AREA (ACRES) =		1913.7				

\*\*\*\*\*

FLOW PROCESS FROM NODE 12023.00 TO NODE 12024.00 IS CODE = 14.0  
-----

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

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2487.49	25.72	0.30 ( 0.30)	1.00	1789.6	12010.00
2	2275.95	32.36	0.30 ( 0.30)	1.00	1913.7	12000.00
TOTAL AREA (ACRES) =		1913.7				

\*\*\*\*\*

FLOW PROCESS FROM NODE 12024.00 TO NODE 12102.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1672.60 DOWNSTREAM(FEET) = 1636.82  
CHANNEL LENGTH THRU SUBAREA(FEET) = 780.49 CHANNEL SLOPE = 0.0458  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.40  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.809

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	93.19	0.30	1.000	-

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2550.76

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.93

AVERAGE FLOW DEPTH(FEET) = 7.39 TRAVEL TIME(MIN.) = 0.93

Tc(MIN.) = 26.66

SUBAREA AREA (ACRES) = 93.19 SUBAREA RUNOFF(CFS) = 126.54

EFFECTIVE AREA(ACRES) = 1882.81 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 2006.9 PEAK FLOW RATE(CFS) = 2556.57

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.40

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 7.40 FLOW VELOCITY(FEET/SEC.) = 13.94

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12102.00 = 16815.09 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12024.00 TO NODE 12102.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION (MIN.) = 26.66
RAINFALL INTENSITY (INCH/HR) = 1.81
AREA-AVERAGED Fm (INCH/HR) = 0.30
AREA-AVERAGED Fp (INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA (ACRES) = 1882.81
TOTAL STREAM AREA (ACRES) = 2006.87
PEAK FLOW RATE (CFS) AT CONFLUENCE = 2556.57

\*\*\*\*\*

FLOW PROCESS FROM NODE 12101.10 TO NODE 12101.20 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH (FEET) = 847.57
ELEVATION DATA: UPSTREAM (FEET) = 3435.00 DOWNSTREAM (FEET) = 2774.23

Tc = K \* [(LENGTH\*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 11.008
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 3.154
SUBAREA Tc AND LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"CHAPARRAL, NARROWLEAF" - 6.56 0.30 1.000 0 11.01
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF (CFS) = 16.85
TOTAL AREA (ACRES) = 6.56 PEAK FLOW RATE (CFS) = 16.85

\*\*\*\*\*

FLOW PROCESS FROM NODE 12101.20 TO NODE 12101.30 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM (FEET) = 2774.23 DOWNSTREAM (FEET) = 2097.09
CHANNEL LENGTH THRU SUBAREA (FEET) = 1205.19 CHANNEL SLOPE = 0.5619
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.51
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.877
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 34.88 0.30 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 57.40
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.78
AVERAGE FLOW DEPTH (FEET) = 0.49 TRAVEL TIME (MIN.) = 1.86
Tc (MIN.) = 12.87
SUBAREA AREA (ACRES) = 34.88 SUBAREA RUNOFF (CFS) = 80.91
EFFECTIVE AREA (ACRES) = 41.44 AREA-AVERAGED Fm (INCH/HR) = 0.30
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA (ACRES) = 41.4 PEAK FLOW RATE (CFS) = 96.13
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.66

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH (FEET) = 0.66 FLOW VELOCITY (FEET/SEC.) = 12.85
LONGEST FLOWPATH FROM NODE 12101.10 TO NODE 12101.30 = 2052.76 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12101.30 TO NODE 12102.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM (FEET) = 2097.09 DOWNSTREAM (FEET) = 1636.82
CHANNEL LENGTH THRU SUBAREA (FEET) = 1553.74 CHANNEL SLOPE = 0.2962
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.07
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.562
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 56.40 0.30 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 153.66
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.20
AVERAGE FLOW DEPTH (FEET) = 1.04 TRAVEL TIME (MIN.) = 2.12
Tc (MIN.) = 14.99
SUBAREA AREA (ACRES) = 56.40 SUBAREA RUNOFF (CFS) = 114.81
EFFECTIVE AREA (ACRES) = 97.84 AREA-AVERAGED Fm (INCH/HR) = 0.30
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA (ACRES) = 97.8 PEAK FLOW RATE (CFS) = 199.18
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.21

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH (FEET) = 1.21 FLOW VELOCITY (FEET/SEC.) = 13.25
LONGEST FLOWPATH FROM NODE 12101.10 TO NODE 12102.00 = 3606.50 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12101.30 TO NODE 12102.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 14.99  
 RAINFALL INTENSITY(INCH/HR) = 2.56  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 97.84  
 TOTAL STREAM AREA(ACRES) = 97.84  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 199.18

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2556.57	26.66	1.809	0.30( 0.30)	1.00	1882.8	12010.00
1	2343.10	33.31	1.597	0.30( 0.30)	1.00	2006.9	12000.00
2	199.18	14.99	2.562	0.30( 0.30)	1.00	97.8	12101.10

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2355.03	14.99	2.562	0.30( 0.30)	1.00	1156.9	12101.10
2	2689.42	26.66	1.809	0.30( 0.30)	1.00	1980.6	12010.00
3	2457.33	33.31	1.597	0.30( 0.30)	1.00	2104.7	12000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 2689.42 Tc(MIN.) = 26.66  
 EFFECTIVE AREA(ACRES) = 1980.65 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 2104.7  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12102.00 = 16815.09 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12102.00 TO NODE 12103.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1636.82 DOWNSTREAM(FEET) = 1558.46  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2049.75 CHANNEL SLOPE = 0.0382  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 8.01  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.710  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 116.59 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2763.43  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.28  
 AVERAGE FLOW DEPTH(FEET) = 8.00 TRAVEL TIME(MIN.) = 2.57  
 Tc(MIN.) = 29.23  
 SUBAREA AREA(ACRES) = 116.59 SUBAREA RUNOFF(CFS) = 148.00  
 EFFECTIVE AREA(ACRES) = 2097.24 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 2221.3 PEAK FLOW RATE(CFS) = 2689.42  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 7.90

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 7.90 FLOW VELOCITY(FEET/SEC.) = 13.19  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12103.00 = 18864.84 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12103.00 TO NODE 12104.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1558.46 DOWNSTREAM(FEET) = 1453.87  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1971.34 CHANNEL SLOPE = 0.0531  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 7.60  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.646  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 355.30 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2904.62  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.20  
 AVERAGE FLOW DEPTH(FEET) = 7.59 TRAVEL TIME(MIN.) = 2.16  
 Tc(MIN.) = 31.39  
 SUBAREA AREA(ACRES) = 355.30 SUBAREA RUNOFF(CFS) = 430.37  
 EFFECTIVE AREA(ACRES) = 2452.54 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 2576.6 PEAK FLOW RATE(CFS) = 2970.74  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 7.67

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 7.67 FLOW VELOCITY(FEET/SEC.) = 15.28  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12104.00 = 20836.18 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12104.00 TO NODE 12105.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1453.87 DOWNSTREAM(FEET) = 1369.72  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1885.63 CHANNEL SLOPE = 0.0446  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 8.13  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.591  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 200.37 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3087.14  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.48  
 AVERAGE FLOW DEPTH(FEET) = 8.12 TRAVEL TIME(MIN.) = 2.17  
 Tc(MIN.) = 33.56  
 SUBAREA AREA(ACRES) = 200.37 SUBAREA RUNOFF(CFS) = 232.81  
 EFFECTIVE AREA(ACRES) = 2652.91 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 2777.0 PEAK FLOW RATE(CFS) = 3082.35  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 8.12

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 8.12 FLOW VELOCITY(FEET/SEC.) = 14.46  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12105.00 = 22721.81 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12105.00 TO NODE 12106.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 1369.72 DOWNSTREAM(FEET) = 1298.29  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1910.12 CHANNEL SLOPE = 0.0374  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 8.69  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.532  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 339.52 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3270.66  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.76  
 AVERAGE FLOW DEPTH(FEET) = 8.69 TRAVEL TIME(MIN.) = 2.31  
 Tc(MIN.) = 35.87  
 SUBAREA AREA(ACRES) = 339.52 SUBAREA RUNOFF(CFS) = 376.59  
 EFFECTIVE AREA(ACRES) = 2992.43 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 3116.5 PEAK FLOW RATE(CFS) = 3319.18  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 8.75

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 8.75 FLOW VELOCITY(FEET/SEC.) = 13.80  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12106.00 = 24631.93 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12106.00 TO NODE 12121.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 1298.29 DOWNSTREAM(FEET) = 1215.72  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2982.44 CHANNEL SLOPE = 0.0277  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 9.48  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.431  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 164.97 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3403.16  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.43  
 AVERAGE FLOW DEPTH(FEET) = 9.47 TRAVEL TIME(MIN.) = 4.00  
 Tc(MIN.) = 39.87  
 SUBAREA AREA(ACRES) = 164.97 SUBAREA RUNOFF(CFS) = 167.96  
 EFFECTIVE AREA(ACRES) = 3157.40 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 3281.5 PEAK FLOW RATE(CFS) = 3319.18  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 9.36

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 9.36 FLOW VELOCITY(FEET/SEC.) = 12.34  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12121.00 = 27614.37 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12106.00 TO NODE 12121.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 =====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 39.87  
 RAINFALL INTENSITY(INCH/HR) = 1.43  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 3157.40  
 TOTAL STREAM AREA(ACRES) = 3281.46  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 3319.18

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12111.00 TO NODE 12112.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
 =====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 939.51  
 ELEVATION DATA: UPSTREAM(FEET) = 3108.05 DOWNSTREAM(FEET) = 2753.95

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.265

\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.819  
SUBAREA Tc AND LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL, BROADLEAF" - 8.25 0.30 1.000 0 13.27  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF (CFS) = 18.70  
TOTAL AREA (ACRES) = 8.25 PEAK FLOW RATE (CFS) = 18.70

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12112.00 TO NODE 12113.00 IS CODE = 56  
-----

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>> TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2753.95 DOWNSTREAM (FEET) = 2458.45  
CHANNEL LENGTH THRU SUBAREA (FEET) = 945.14 CHANNEL SLOPE = 0.3127  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\* ESTIMATED CHANNEL HEIGHT (FEET) = 0.45

\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.529  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 16.51 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 35.29  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.41  
AVERAGE FLOW DEPTH (FEET) = 0.44 TRAVEL TIME (MIN.) = 2.12  
Tc (MIN.) = 15.39  
SUBAREA AREA (ACRES) = 16.51 SUBAREA RUNOFF (CFS) = 33.12  
EFFECTIVE AREA (ACRES) = 24.76 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 24.8 PEAK FLOW RATE (CFS) = 49.67  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\* ESTIMATED CHANNEL HEIGHT (FEET) = 0.53

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.53 FLOW VELOCITY (FEET/SEC.) = 8.45  
LONGEST FLOWPATH FROM NODE 12111.00 TO NODE 12113.00 = 1884.65 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12113.00 TO NODE 12114.00 IS CODE = 56  
-----

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>> TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2458.45 DOWNSTREAM (FEET) = 1823.37  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1903.76 CHANNEL SLOPE = 0.3336  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\* ESTIMATED CHANNEL HEIGHT (FEET) = 0.82  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.294  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 57.98 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 101.83  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.03  
AVERAGE FLOW DEPTH (FEET) = 0.80 TRAVEL TIME (MIN.) = 2.88  
Tc (MIN.) = 18.27  
SUBAREA AREA (ACRES) = 57.98 SUBAREA RUNOFF (CFS) = 104.04  
EFFECTIVE AREA (ACRES) = 82.74 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 82.7 PEAK FLOW RATE (CFS) = 148.47  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\* ESTIMATED CHANNEL HEIGHT (FEET) = 0.99

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.99 FLOW VELOCITY (FEET/SEC.) = 12.53  
LONGEST FLOWPATH FROM NODE 12111.00 TO NODE 12114.00 = 3788.41 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12114.00 TO NODE 12115.00 IS CODE = 56  
-----

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>> TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1823.37 DOWNSTREAM (FEET) = 1500.53  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1685.04 CHANNEL SLOPE = 0.1916  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\* ESTIMATED CHANNEL HEIGHT (FEET) = 1.59  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.121

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 124.07 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 250.22  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.29  
AVERAGE FLOW DEPTH (FEET) = 1.55 TRAVEL TIME (MIN.) = 2.29  
Tc (MIN.) = 20.55  
SUBAREA AREA (ACRES) = 124.07 SUBAREA RUNOFF (CFS) = 203.35  
EFFECTIVE AREA (ACRES) = 206.81 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 206.8 PEAK FLOW RATE (CFS) = 338.97  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\* ESTIMATED CHANNEL HEIGHT (FEET) = 1.84

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.84 FLOW VELOCITY (FEET/SEC.) = 13.45  
LONGEST FLOWPATH FROM NODE 12111.00 TO NODE 12115.00 = 5473.45 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12115.00 TO NODE 12121.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1500.53 DOWNSTREAM(FEET) = 1215.72
CHANNEL LENGTH THRU SUBAREA(FEET) = 1875.45 CHANNEL SLOPE = 0.1519
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.12
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.985

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 62.55 0.30 1.000 -

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 386.42

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.89

AVERAGE FLOW DEPTH(FEET) = 2.11 TRAVEL TIME(MIN.) = 2.42

Tc(MIN.) = 22.98

SUBAREA AREA(ACRES) = 62.55 SUBAREA RUNOFF(CFS) = 94.88

EFFECTIVE AREA(ACRES) = 269.36 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 269.4 PEAK FLOW RATE(CFS) = 408.57

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.17

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.17 FLOW VELOCITY(FEET/SEC.) = 13.12

LONGEST FLOWPATH FROM NODE 12111.00 TO NODE 12121.00 = 7348.90 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 12115.00 TO NODE 12121.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 22.98

RAINFALL INTENSITY(INCH/HR) = 1.99

AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA(ACRES) = 269.36

TOTAL STREAM AREA(ACRES) = 269.36

PEAK FLOW RATE(CFS) AT CONFLUENCE = 408.57

\*\* CONFLUENCE DATA \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 3132.93 28.46 1.740 0.30( 0.30) 1.00 2333.6 12101.10
1 3319.18 39.87 1.431 0.30( 0.30) 1.00 3157.4 12010.00
1 3039.04 46.84 1.317 0.30( 0.30) 1.00 3281.5 12000.00
2 408.57 22.98 1.985 0.30( 0.30) 1.00 269.4 12111.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 3369.10 22.98 1.985 0.30( 0.30) 1.00 2153.4 12111.00
2 3481.99 28.46 1.740 0.30( 0.30) 1.00 2603.0 12101.10
3 3593.42 39.87 1.431 0.30( 0.30) 1.00 3426.8 12010.00
4 3285.63 46.84 1.317 0.30( 0.30) 1.00 3550.8 12000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 3593.42 Tc(MIN.) = 39.87

EFFECTIVE AREA(ACRES) = 3426.76 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 3550.8

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12121.00 = 27614.37 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 12121.00 TO NODE 12241.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1215.72 DOWNSTREAM(FEET) = 1122.29
CHANNEL LENGTH THRU SUBAREA(FEET) = 3397.13 CHANNEL SLOPE = 0.0275
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 9.80
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.357

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 136.41 0.30 1.000 -

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3658.33

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.63

AVERAGE FLOW DEPTH(FEET) = 9.79 TRAVEL TIME(MIN.) = 4.48

Tc(MIN.) = 44.36

SUBAREA AREA(ACRES) = 136.41 SUBAREA RUNOFF(CFS) = 129.82

EFFECTIVE AREA(ACRES) = 3563.17 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 3687.2 PEAK FLOW RATE(CFS) = 3593.42

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 9.72

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 9.72 FLOW VELOCITY(FEET/SEC.) = 12.56

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12241.00 = 31011.50 FEET.

\*\*\*\*\*
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 3687.2 TC(MIN.) = 44.36

EFFECTIVE AREA(ACRES) = 3563.17 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.000

PEAK FLOW RATE(CFS) = 3593.42

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3369.10	27.53	1.775	0.30 ( 0.30)	1.00	2289.8	12111.00
2	3481.99	32.98	1.606	0.30 ( 0.30)	1.00	2739.4	12101.10
3	3593.42	44.36	1.357	0.30 ( 0.30)	1.00	3563.2	12010.00
4	3285.63	51.43	1.249	0.30 ( 0.30)	1.00	3687.2	12000.00

=====  
 END OF RATIONAL METHOD ANALYSIS  
 =====

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

Analysis prepared by:

-----  
FILE NAME: S22.DAT  
TIME/DATE OF STUDY: 11:58 04/03/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.059
- 2) 10.00; 3.304
- 3) 15.00; 2.561
- 4) 20.00; 2.152
- 5) 25.00; 1.872
- 6) 30.00; 1.681
- 7) 40.00; 1.428
- 8) 50.00; 1.266
- 9) 60.00; 1.147
- 10) 90.00; 0.946
- 11) 120.00; 0.816
- 12) 180.00; 0.687
- 13) 360.00; 0.499
- 14) 1440.00; 0.216

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	STREETS FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12201.00 TO NODE 12202.00 IS CODE = 21  
-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 926.94  
ELEVATION DATA: UPSTREAM(FEET) = 3077.00 DOWNSTREAM(FEET) = 2740.64

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.295  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.814  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" - 5.74 0.30 1.000 0 13.29  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 12.99  
TOTAL AREA (ACRES) = 5.74 PEAK FLOW RATE (CFS) = 12.99

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12202.00 TO NODE 12203.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2740.64 DOWNSTREAM(FEET) = 2551.60  
CHANNEL LENGTH THRU SUBAREA(FEET) = 832.53 CHANNEL SLOPE = 0.2271  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.47  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.525  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN  
USER-DEFINED - 18.85 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.91  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.46  
AVERAGE FLOW DEPTH(FEET) = 0.45 TRAVEL TIME(MIN.) = 2.15  
Tc(MIN.) = 15.44  
SUBAREA AREA(ACRES) = 18.85 SUBAREA RUNOFF(CFS) = 37.74  
EFFECTIVE AREA(ACRES) = 24.59 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 24.6 PEAK FLOW RATE(CFS) = 49.24  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.58

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.58 FLOW VELOCITY(FEET/SEC.) = 7.57  
LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12203.00 = 1759.47 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12203.00 TO NODE 12204.00 IS CODE = 56



-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2551.60 DOWNSTREAM(FEET) = 2151.76  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2056.86 CHANNEL SLOPE = 0.1944  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.09

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.239

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	83.93	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 122.76

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.83

AVERAGE FLOW DEPTH(FEET) = 1.03 TRAVEL TIME(MIN.) = 3.49

Tc(MIN.) = 18.93

SUBAREA AREA(ACRES) = 83.93 SUBAREA RUNOFF(CFS) = 146.51

EFFECTIVE AREA(ACRES) = 108.52 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 108.5 PEAK FLOW RATE(CFS) = 189.43

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.32 FLOW VELOCITY(FEET/SEC.) = 11.31

LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12204.00 = 3816.33 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12204.00 TO NODE 12205.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2151.76 DOWNSTREAM(FEET) = 1788.16  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2363.99 CHANNEL SLOPE = 0.1538  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.99

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.034

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	182.26	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 331.83

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.38

AVERAGE FLOW DEPTH(FEET) = 1.93 TRAVEL TIME(MIN.) = 3.18

Tc(MIN.) = 22.11

SUBAREA AREA(ACRES) = 182.26 SUBAREA RUNOFF(CFS) = 284.39

EFFECTIVE AREA(ACRES) = 290.78 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 290.8 PEAK FLOW RATE(CFS) = 453.72

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.29

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.29 FLOW VELOCITY(FEET/SEC.) = 13.56

LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12205.00 = 6180.32 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12205.00 TO NODE 12206.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1788.16 DOWNSTREAM(FEET) = 1385.78  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2825.33 CHANNEL SLOPE = 0.1424  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.65

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.854

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	153.05	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 560.82

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.03

AVERAGE FLOW DEPTH(FEET) = 2.62 TRAVEL TIME(MIN.) = 3.36

Tc(MIN.) = 25.47

SUBAREA AREA(ACRES) = 153.05 SUBAREA RUNOFF(CFS) = 214.08

EFFECTIVE AREA(ACRES) = 443.83 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 443.8 PEAK FLOW RATE(CFS) = 620.81

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.77

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.77 FLOW VELOCITY(FEET/SEC.) = 14.45

LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12206.00 = 9005.65 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12206.00 TO NODE 12221.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1385.78 DOWNSTREAM(FEET) = 1006.12  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3579.23 CHANNEL SLOPE = 0.1061  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.21

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.685

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	132.52	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 703.43  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 13.45  
 AVERAGE FLOW DEPTH( FEET) = 3.19 TRAVEL TIME( MIN.) = 4.43  
 Tc( MIN.) = 29.90  
 SUBAREA AREA( ACRES) = 132.52 SUBAREA RUNOFF( CFS) = 165.16  
 EFFECTIVE AREA( ACRES) = 576.35 AREA-AVERAGED Fm( INCH/HR) = 0.30  
 AREA-AVERAGED Fp( INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA( ACRES) = 576.4 PEAK FLOW RATE( CFS) = 718.30  
 GIVEN CHANNEL BASE( FEET) = 10.00 CHANNEL FREEBOARD( FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT( FEET) = 3.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH( FEET) = 3.22 FLOW VELOCITY( FEET/SEC.) = 13.54  
 LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12221.00 = 12584.88 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12206.00 TO NODE 12221.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION( MIN.) = 29.90  
 RAINFALL INTENSITY( INCH/HR) = 1.68  
 AREA-AVERAGED Fm( INCH/HR) = 0.30  
 AREA-AVERAGED Fp( INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA( ACRES) = 576.35  
 TOTAL STREAM AREA( ACRES) = 576.35  
 PEAK FLOW RATE( CFS) AT CONFLUENCE = 718.30

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12211.00 TO NODE 12212.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH( FEET) = 733.41  
 ELEVATION DATA: UPSTREAM( FEET) = 1669.93 DOWNSTREAM( FEET) = 1536.26

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc( MIN.) = 13.893  
 \* 50 YEAR RAINFALL INTENSITY( INCH/HR) = 2.725  
 SUBAREA Tc AND LOSS RATE DATA( AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "GRASS"	-	8.90	0.30	1.000	0	13.89

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp( INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF( CFS) = 19.43  
 TOTAL AREA( ACRES) = 8.90 PEAK FLOW RATE( CFS) = 19.43

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12212.00 TO NODE 12213.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM( FEET) = 1536.26 DOWNSTREAM( FEET) = 1416.02  
 CHANNEL LENGTH THRU SUBAREA( FEET) = 1253.05 CHANNEL SLOPE = 0.0960  
 GIVEN CHANNEL BASE( FEET) = 10.00 CHANNEL FREEBOARD( FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT( FEET) = 0.65  
 \* 50 YEAR RAINFALL INTENSITY( INCH/HR) = 2.318

SUBAREA LOSS RATE DATA( AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	17.91	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp( INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW( CFS) = 35.77  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 5.13  
 AVERAGE FLOW DEPTH( FEET) = 0.62 TRAVEL TIME( MIN.) = 4.07  
 Tc( MIN.) = 17.97

SUBAREA AREA( ACRES) = 17.91 SUBAREA RUNOFF( CFS) = 32.53  
 EFFECTIVE AREA( ACRES) = 26.81 AREA-AVERAGED Fm( INCH/HR) = 0.30  
 AREA-AVERAGED Fp( INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA( ACRES) = 26.8 PEAK FLOW RATE( CFS) = 48.70  
 GIVEN CHANNEL BASE( FEET) = 10.00 CHANNEL FREEBOARD( FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT( FEET) = 0.74

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH( FEET) = 0.74 FLOW VELOCITY( FEET/SEC.) = 5.71  
 LONGEST FLOWPATH FROM NODE 12211.00 TO NODE 12213.00 = 1986.46 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12213.00 TO NODE 12214.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM( FEET) = 1416.02 DOWNSTREAM( FEET) = 1234.66  
 CHANNEL LENGTH THRU SUBAREA( FEET) = 1877.62 CHANNEL SLOPE = 0.0966  
 GIVEN CHANNEL BASE( FEET) = 10.00 CHANNEL FREEBOARD( FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT( FEET) = 1.48  
 \* 50 YEAR RAINFALL INTENSITY( INCH/HR) = 2.053

SUBAREA LOSS RATE DATA( AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	125.19	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp( INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW( CFS) = 147.81  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 8.24  
 AVERAGE FLOW DEPTH( FEET) = 1.40 TRAVEL TIME( MIN.) = 3.80  
 Tc( MIN.) = 21.76

SUBAREA AREA( ACRES) = 125.19 SUBAREA RUNOFF( CFS) = 197.54  
 EFFECTIVE AREA( ACRES) = 152.00 AREA-AVERAGED Fm( INCH/HR) = 0.30  
 AREA-AVERAGED Fp( INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA( ACRES) = 152.0 PEAK FLOW RATE( CFS) = 239.84

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.84

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.84 FLOW VELOCITY (FEET/SEC.) = 9.56  
LONGEST FLOWPATH FROM NODE 12211.00 TO NODE 12214.00 = 3864.08 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12214.00 TO NODE 12221.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) =	1234.66	DOWNSTREAM (FEET) =	1006.12
CHANNEL LENGTH THRU SUBAREA (FEET) =	2510.91	CHANNEL SLOPE =	0.0910
GIVEN CHANNEL BASE (FEET) =	10.00	CHANNEL FREEBOARD (FEET) =	0.0
"Z" FACTOR =	2.000	MANNING'S FACTOR =	0.060
*ESTIMATED CHANNEL HEIGHT (FEET) =	2.80		
* 50 YEAR RAINFALL INTENSITY (INCH/HR) =	1.856		

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	339.35	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 477.80

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.43

AVERAGE FLOW DEPTH (FEET) = 2.71 TRAVEL TIME (MIN.) = 3.66

Tc (MIN.) = 25.43

SUBAREA AREA (ACRES) = 339.35 SUBAREA RUNOFF (CFS) = 475.15

EFFECTIVE AREA (ACRES) = 491.35 AREA-AVERAGED Fm (INCH/HR) = 0.30

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 491.4 PEAK FLOW RATE (CFS) = 687.97

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.28

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 3.28 FLOW VELOCITY (FEET/SEC.) = 12.65

LONGEST FLOWPATH FROM NODE 12211.00 TO NODE 12221.00 = 6374.99 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12214.00 TO NODE 12221.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION (MIN.) = 25.43

RAINFALL INTENSITY (INCH/HR) = 1.86

AREA-AVERAGED Fm (INCH/HR) = 0.30

AREA-AVERAGED Fp (INCH/HR) = 0.30

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA (ACRES) = 491.35

TOTAL STREAM AREA (ACRES) = 491.35

PEAK FLOW RATE (CFS) AT CONFLUENCE = 687.97

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	718.30	29.90	1.685	0.30 ( 0.30)	1.00	576.4	12201.00
2	687.97	25.43	1.856	0.30 ( 0.30)	1.00	491.4	12211.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1374.17	25.43	1.856	0.30 ( 0.30)	1.00	981.4	12211.00
2	1330.66	29.90	1.685	0.30 ( 0.30)	1.00	1067.7	12201.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 1374.17 Tc (MIN.) = 25.43

EFFECTIVE AREA (ACRES) = 981.43 AREA-AVERAGED Fm (INCH/HR) = 0.30

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 1067.7

LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12221.00 = 12584.88 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12221.00 TO NODE 12251.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) =	1006.12	DOWNSTREAM (FEET) =	897.69
CHANNEL LENGTH THRU SUBAREA (FEET) =	2362.84	CHANNEL SLOPE =	0.0459
GIVEN CHANNEL BASE (FEET) =	10.00	CHANNEL FREEBOARD (FEET) =	0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.68

\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.731

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	127.60	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1456.34

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.05

AVERAGE FLOW DEPTH (FEET) = 5.67 TRAVEL TIME (MIN.) = 3.27

Tc (MIN.) = 28.70

SUBAREA AREA (ACRES) = 127.60 SUBAREA RUNOFF (CFS) = 164.32

EFFECTIVE AREA (ACRES) = 1109.03 AREA-AVERAGED Fm (INCH/HR) = 0.30

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 1195.3 PEAK FLOW RATE (CFS) = 1428.22

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.61

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 5.61 FLOW VELOCITY (FEET/SEC.) = 11.99

LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12251.00 = 14947.72 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12221.00 TO NODE 12251.00 IS CODE = 10

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

\*\*\*\*\*

FLOW PROCESS FROM NODE 12231.00 TO NODE 12231.50 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 553.71  
ELEVATION DATA: UPSTREAM(FEET) = 2687.04 DOWNSTREAM(FEET) = 2470.68

Tc = K \* [(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.660  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.206  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" - 3.48 0.30 1.000 0 10.66  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 9.10  
TOTAL AREA(ACRES) = 3.48 PEAK FLOW RATE(CFS) = 9.10

\*\*\*\*\*

FLOW PROCESS FROM NODE 12231.50 TO NODE 12232.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2470.68 DOWNSTREAM(FEET) = 2375.54  
CHANNEL LENGTH THRU SUBAREA(FEET) = 410.38 CHANNEL SLOPE = 0.2318  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.39  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.034  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 12.43 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 24.41  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.90  
AVERAGE FLOW DEPTH(FEET) = 0.38 TRAVEL TIME(MIN.) = 1.16  
Tc(MIN.) = 11.82  
SUBAREA AREA(ACRES) = 12.43 SUBAREA RUNOFF(CFS) = 30.58  
EFFECTIVE AREA(ACRES) = 15.91 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 15.9 PEAK FLOW RATE(CFS) = 39.14  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.51

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.51 FLOW VELOCITY(FEET/SEC.) = 7.02  
LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12232.00 = 964.09 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12232.00 TO NODE 12233.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2375.54 DOWNSTREAM(FEET) = 2252.99  
CHANNEL LENGTH THRU SUBAREA(FEET) = 939.16 CHANNEL SLOPE = 0.1305  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.77  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.687  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 17.65 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 58.15  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.72  
AVERAGE FLOW DEPTH(FEET) = 0.75 TRAVEL TIME(MIN.) = 2.33  
Tc(MIN.) = 14.15  
SUBAREA AREA(ACRES) = 17.65 SUBAREA RUNOFF(CFS) = 37.92  
EFFECTIVE AREA(ACRES) = 33.56 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 33.6 PEAK FLOW RATE(CFS) = 72.11  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.85

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.85 FLOW VELOCITY(FEET/SEC.) = 7.23  
LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12233.00 = 1903.25 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12233.00 TO NODE 12234.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2252.99 DOWNSTREAM(FEET) = 2163.07  
CHANNEL LENGTH THRU SUBAREA(FEET) = 976.53 CHANNEL SLOPE = 0.0921  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.09  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.439  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 19.54 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 90.93  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.93  
AVERAGE FLOW DEPTH(FEET) = 1.08 TRAVEL TIME(MIN.) = 2.35

Tc(MIN.) = 16.50  
SUBAREA AREA(ACRES) = 19.54 SUBAREA RUNOFF(CFS) = 37.61  
EFFECTIVE AREA(ACRES) = 53.10 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 53.1 PEAK FLOW RATE(CFS) = 102.21  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.15

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.15 FLOW VELOCITY(FEET/SEC.) = 7.19  
LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12234.00 = 2879.78 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12234.00 TO NODE 12235.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2163.07 DOWNSTREAM(FEET) = 2018.08  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1909.65 CHANNEL SLOPE = 0.0759  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.52

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.111  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 51.14 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 143.96  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.52  
AVERAGE FLOW DEPTH(FEET) = 1.48 TRAVEL TIME(MIN.) = 4.23  
Tc(MIN.) = 20.73

SUBAREA AREA(ACRES) = 51.14 SUBAREA RUNOFF(CFS) = 83.37  
EFFECTIVE AREA(ACRES) = 104.24 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 104.2 PEAK FLOW RATE(CFS) = 169.93  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.62

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.62 FLOW VELOCITY(FEET/SEC.) = 7.91  
LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12235.00 = 4789.43 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12235.00 TO NODE 12236.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2018.08 DOWNSTREAM(FEET) = 1607.89  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1896.94 CHANNEL SLOPE = 0.2162  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.36

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.964  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 47.44 0.30 1.000 -

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 205.48  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.03  
AVERAGE FLOW DEPTH(FEET) = 1.35 TRAVEL TIME(MIN.) = 2.63  
Tc(MIN.) = 23.36

SUBAREA AREA(ACRES) = 47.44 SUBAREA RUNOFF(CFS) = 71.05  
EFFECTIVE AREA(ACRES) = 151.68 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 151.7 PEAK FLOW RATE(CFS) = 227.18  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.42

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.42 FLOW VELOCITY(FEET/SEC.) = 12.42  
LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12236.00 = 6686.37 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12236.00 TO NODE 12237.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1607.89 DOWNSTREAM(FEET) = 1326.23  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2213.20 CHANNEL SLOPE = 0.1273  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.90

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.808  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 87.00 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 286.23  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.07  
AVERAGE FLOW DEPTH(FEET) = 1.88 TRAVEL TIME(MIN.) = 3.33  
Tc(MIN.) = 26.69

SUBAREA AREA(ACRES) = 87.00 SUBAREA RUNOFF(CFS) = 118.04  
EFFECTIVE AREA(ACRES) = 238.68 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 238.7 PEAK FLOW RATE(CFS) = 323.84  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.01

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.01 FLOW VELOCITY(FEET/SEC.) = 11.50  
LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12237.00 = 8899.57 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12237.00 TO NODE 12241.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1326.23 DOWNSTREAM(FEET) = 1122.29
CHANNEL LENGTH THRU SUBAREA(FEET) = 2236.51 CHANNEL SLOPE = 0.0912
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.40
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.676

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 81.83 0.30 1.000 -

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 374.54

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.68

AVERAGE FLOW DEPTH(FEET) = 2.38 TRAVEL TIME(MIN.) = 3.49

Tc(MIN.) = 30.18

SUBAREA AREA(ACRES) = 81.83 SUBAREA RUNOFF(CFS) = 101.38

EFFECTIVE AREA(ACRES) = 320.51 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 320.5 PEAK FLOW RATE(CFS) = 397.07

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.45

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.45 FLOW VELOCITY(FEET/SEC.) = 10.85

LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12241.00 = 11136.08 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12237.00 TO NODE 12241.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2<<<<

\*\*\*\*\*

FLOW PROCESS FROM NODE 12241.00 TO NODE 12241.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3<<<<

PEAK FLOWRATE TABLE FILE NAME: S21.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM Q Tc Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (ACRES) NODE
1 3369.10 27.53 0.30( 0.30) 1.00 2289.8 12111.00
2 3481.99 32.98 0.30( 0.30) 1.00 2739.4 12101.10
3 3593.42 44.36 0.30( 0.30) 1.00 3563.2 12010.00
4 3285.63 51.43 0.30( 0.30) 1.00 3687.2 12000.00
TOTAL AREA(ACRES) = 3687.2

\*\*\*\*\*

FLOW PROCESS FROM NODE 12241.00 TO NODE 12241.00 IS CODE = 14.0

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM Q Tc Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (ACRES) NODE
1 3369.10 27.53 0.30( 0.30) 1.00 2289.8 12111.00
2 3481.99 32.98 0.30( 0.30) 1.00 2739.4 12101.10
3 3593.42 44.36 0.30( 0.30) 1.00 3563.2 12010.00
4 3285.63 51.43 0.30( 0.30) 1.00 3687.2 12000.00
TOTAL AREA(ACRES) = 3687.2

\*\*\*\*\*

FLOW PROCESS FROM NODE 12237.00 TO NODE 12241.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 3369.10 27.53 1.775 0.30( 0.30) 1.00 2289.8 12111.00
2 3481.99 32.98 1.606 0.30( 0.30) 1.00 2739.4 12101.10
3 3593.42 44.36 1.357 0.30( 0.30) 1.00 3563.2 12010.00
4 3285.63 51.43 1.249 0.30( 0.30) 1.00 3687.2 12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12241.00 = 31011.50 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 397.07 30.18 1.676 0.30( 0.30) 1.00 320.5 12231.00

LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12241.00 = 11136.08 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 3757.32 27.53 1.775 0.30( 0.30) 1.00 2582.1 12111.00
2 3821.10 30.18 1.676 0.30( 0.30) 1.00 2829.1 12231.00
3 3858.65 32.98 1.606 0.30( 0.30) 1.00 3059.9 12101.10
4 3898.45 44.36 1.357 0.30( 0.30) 1.00 3883.7 12010.00
5 3559.38 51.43 1.249 0.30( 0.30) 1.00 4007.7 12000.00
TOTAL AREA(ACRES) = 4007.7

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 3898.45 Tc(MIN.) = 44.359

EFFECTIVE AREA(ACRES) = 3883.68 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 4007.7

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12241.00 = 31011.50 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12241.00 TO NODE 12242.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1122.29 DOWNSTREAM(FEET) = 1062.50

CHANNEL LENGTH THRU SUBAREA(FEET) = 2053.03 CHANNEL SLOPE = 0.0291

GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 8.40  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.315  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	219.09	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3998.49  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.96  
 AVERAGE FLOW DEPTH(FEET) = 8.39 TRAVEL TIME(MIN.) = 2.64  
 Tc(MIN.) = 47.00  
 SUBAREA AREA(ACRES) = 219.09 SUBAREA RUNOFF(CFS) = 200.08  
 EFFECTIVE AREA(ACRES) = 4102.77 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 4226.8 PEAK FLOW RATE(CFS) = 3898.45  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 8.28

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 8.28 FLOW VELOCITY(FEET/SEC.) = 12.87  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12242.00 = 33064.53 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12242.00 TO NODE 12243.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 -----

ELEVATION DATA: UPSTREAM(FEET) = 1062.50 DOWNSTREAM(FEET) = 998.53  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1931.30 CHANNEL SLOPE = 0.0331  
 GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 8.14  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.276  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	249.96	0.30	0.995	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.995  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4008.44  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.58  
 AVERAGE FLOW DEPTH(FEET) = 8.14 TRAVEL TIME(MIN.) = 2.37  
 Tc(MIN.) = 49.37  
 SUBAREA AREA(ACRES) = 249.96 SUBAREA RUNOFF(CFS) = 219.97  
 EFFECTIVE AREA(ACRES) = 4352.73 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 4476.8 PEAK FLOW RATE(CFS) = 3898.45  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 8.02

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.02 FLOW VELOCITY(FEET/SEC.) = 13.48  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12243.00 = 34995.83 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12243.00 TO NODE 12244.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 -----

ELEVATION DATA: UPSTREAM(FEET) = 998.53 DOWNSTREAM(FEET) = 926.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1863.28 CHANNEL SLOPE = 0.0389  
 GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 7.78  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.248  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	166.97	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3969.67  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.37  
 AVERAGE FLOW DEPTH(FEET) = 7.77 TRAVEL TIME(MIN.) = 2.16  
 Tc(MIN.) = 51.53  
 SUBAREA AREA(ACRES) = 166.97 SUBAREA RUNOFF(CFS) = 142.44  
 EFFECTIVE AREA(ACRES) = 4519.70 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 4643.8 PEAK FLOW RATE(CFS) = 3898.45  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 7.70

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 7.70 FLOW VELOCITY(FEET/SEC.) = 14.30  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12244.00 = 36859.11 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12244.00 TO NODE 12251.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 -----

ELEVATION DATA: UPSTREAM(FEET) = 926.00 DOWNSTREAM(FEET) = 897.69  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1665.37 CHANNEL SLOPE = 0.0170  
 GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 9.52  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.217  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	83.41	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3932.86  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.59

AVERAGE FLOW DEPTH(FEET) = 9.52 TRAVEL TIME(MIN.) = 2.62  
Tc(MIN.) = 54.15  
SUBAREA AREA(ACRES) = 83.41 SUBAREA RUNOFF(CFS) = 68.81  
EFFECTIVE AREA(ACRES) = 4603.11 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 4727.2 PEAK FLOW RATE(CFS) = 3898.45  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 9.47

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 9.47 FLOW VELOCITY(FEET/SEC.) = 10.57  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12251.00 = 38524.48 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12221.00 TO NODE 12251.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3757.32	37.40	1.494	0.30( 0.30)	1.00	3301.6	12111.00
2	3821.10	40.01	1.428	0.30( 0.30)	1.00	3548.5	12231.00
3	3858.65	42.79	1.383	0.30( 0.30)	1.00	3779.3	12101.10
4	3898.45	54.15	1.217	0.30( 0.30)	1.00	4603.1	12010.00
5	3601.33	61.46	1.137	0.30( 0.30)	1.00	4727.2	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12251.00 = 38524.48 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1428.22	28.70	1.731	0.30( 0.30)	1.00	1109.0	12211.00
2	1398.48	33.21	1.600	0.30( 0.30)	1.00	1195.3	12201.00

LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12251.00 = 14947.72 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4883.43	28.70	1.731	0.30( 0.30)	1.00	3642.2	12211.00
2	5030.89	33.21	1.600	0.30( 0.30)	1.00	4126.5	12201.00
3	5041.63	37.40	1.494	0.30( 0.30)	1.00	4496.9	12111.00
4	5034.50	40.01	1.428	0.30( 0.30)	1.00	4743.8	12231.00
5	5023.65	42.79	1.383	0.30( 0.30)	1.00	4974.6	12101.10
6	4884.57	54.15	1.217	0.30( 0.30)	1.00	5798.4	12010.00
7	4502.09	61.46	1.137	0.30( 0.30)	1.00	5922.5	12000.00

TOTAL AREA(ACRES) = 5922.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 5041.63 Tc(MIN.) = 37.400  
EFFECTIVE AREA(ACRES) = 4496.87 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 5922.5  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12251.00 = 38524.48 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12251.00 TO NODE 12281.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 897.69 DOWNSTREAM(FEET) = 846.91  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2133.08 CHANNEL SLOPE = 0.0238  
GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 9.94  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.425

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	85.79	0.30	1.000	-

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5085.07

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.83

AVERAGE FLOW DEPTH(FEET) = 9.94 TRAVEL TIME(MIN.) = 2.77

Tc(MIN.) = 40.17

SUBAREA AREA(ACRES) = 85.79 SUBAREA RUNOFF(CFS) = 86.89

EFFECTIVE AREA(ACRES) = 4582.66 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 6008.3 PEAK FLOW RATE(CFS) = 5041.63

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 9.90

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 9.90 FLOW VELOCITY(FEET/SEC.) = 12.80

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12281.00 = 40657.56 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12251.00 TO NODE 12281.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 40.17

RAINFALL INTENSITY(INCH/HR) = 1.43

AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA(ACRES) = 4582.66

TOTAL STREAM AREA(ACRES) = 6008.26

PEAK FLOW RATE(CFS) AT CONFLUENCE = 5041.63

\*\*\*\*\*

FLOW PROCESS FROM NODE 12261.00 TO NODE 12261.50 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 378.71

ELEVATION DATA: UPSTREAM(FEET) = 2264.27 DOWNSTREAM(FEET) = 2072.51



Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.694  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.762  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	2.96	0.30	1.000	0	8.69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 9.22  
 TOTAL AREA(ACRES) = 2.96 PEAK FLOW RATE(CFS) = 9.22

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12261.50 TO NODE 12262.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2072.51 DOWNSTREAM(FEET) = 1875.51  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 609.41 CHANNEL SLOPE = 0.3233  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.35  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.261

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	9.89	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 22.44  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.36  
 AVERAGE FLOW DEPTH(FEET) = 0.33 TRAVEL TIME(MIN.) = 1.60  
 Tc(MIN.) = 10.29  
 SUBAREA AREA(ACRES) = 9.89 SUBAREA RUNOFF(CFS) = 26.35  
 EFFECTIVE AREA(ACRES) = 12.85 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 12.9 PEAK FLOW RATE(CFS) = 34.24  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.42

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.42 FLOW VELOCITY(FEET/SEC.) = 7.47  
 LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12262.00 = 988.12 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12262.00 TO NODE 12263.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 1875.51 DOWNSTREAM(FEET) = 1686.10  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 967.89 CHANNEL SLOPE = 0.1957  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.70  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.953  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	22.00	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 60.55  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.79  
 AVERAGE FLOW DEPTH(FEET) = 0.68 TRAVEL TIME(MIN.) = 2.07  
 Tc(MIN.) = 12.36  
 SUBAREA AREA(ACRES) = 22.00 SUBAREA RUNOFF(CFS) = 52.53  
 EFFECTIVE AREA(ACRES) = 34.85 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 34.8 PEAK FLOW RATE(CFS) = 83.21  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.83

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.83 FLOW VELOCITY(FEET/SEC.) = 8.64  
 LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12263.00 = 1956.01 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12263.00 TO NODE 12264.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 1686.10 DOWNSTREAM(FEET) = 1572.93  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 944.28 CHANNEL SLOPE = 0.1198  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.20  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.672

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	35.72	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 121.40  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.33  
 AVERAGE FLOW DEPTH(FEET) = 1.18 TRAVEL TIME(MIN.) = 1.89  
 Tc(MIN.) = 14.25  
 SUBAREA AREA(ACRES) = 35.72 SUBAREA RUNOFF(CFS) = 76.26  
 EFFECTIVE AREA(ACRES) = 70.57 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 70.6 PEAK FLOW RATE(CFS) = 150.67  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.33

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.33 FLOW VELOCITY(FEET/SEC.) = 8.93  
 LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12264.00 = 2900.29 FEET.

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FLOW PROCESS FROM NODE 12264.00 TO NODE 12265.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1572.93 DOWNSTREAM(FEET) = 1506.41
CHANNEL LENGTH THRU SUBAREA(FEET) = 569.03 CHANNEL SLOPE = 0.1169
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.56
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.541
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
LAND USE            GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -         43.21    0.30    0.886    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.886
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 194.92
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.57
AVERAGE FLOW DEPTH(FEET) = 1.55 TRAVEL TIME(MIN.) = 0.99
Tc(MIN.) = 15.24
SUBAREA AREA(ACRES) = 43.21 SUBAREA RUNOFF(CFS) = 88.49
EFFECTIVE AREA(ACRES) = 113.78 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 113.8 PEAK FLOW RATE(CFS) = 230.83
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.71

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.71 FLOW VELOCITY(FEET/SEC.) = 10.09
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12265.00 = 3469.32 FEET.

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FLOW PROCESS FROM NODE 12265.00 TO NODE 12266.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1506.41 DOWNSTREAM(FEET) = 1311.17
CHANNEL LENGTH THRU SUBAREA(FEET) = 2121.93 CHANNEL SLOPE = 0.0920
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.17
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.255
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
LAND USE            GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -         84.55    0.30    0.710    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.710
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 308.60
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.10
AVERAGE FLOW DEPTH(FEET) = 2.14 TRAVEL TIME(MIN.) = 3.50
Tc(MIN.) = 18.74
SUBAREA AREA(ACRES) = 84.55 SUBAREA RUNOFF(CFS) = 155.38
EFFECTIVE AREA(ACRES) = 198.33 AREA-AVERAGED Fm(INCH/HR) = 0.26

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AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.85
TOTAL AREA(ACRES) = 198.3 PEAK FLOW RATE(CFS) = 356.89
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.31

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.31 FLOW VELOCITY(FEET/SEC.) = 10.54
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12266.00 = 5591.25 FEET.

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FLOW PROCESS FROM NODE 12266.00 TO NODE 12267.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1311.17 DOWNSTREAM(FEET) = 1232.47
CHANNEL LENGTH THRU SUBAREA(FEET) = 1555.18 CHANNEL SLOPE = 0.0506
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.25
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.067
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
LAND USE            GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -         160.37   0.30    0.633    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.633
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 492.39
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.32
AVERAGE FLOW DEPTH(FEET) = 3.21 TRAVEL TIME(MIN.) = 2.78
Tc(MIN.) = 21.52
SUBAREA AREA(ACRES) = 160.37 SUBAREA RUNOFF(CFS) = 270.89
EFFECTIVE AREA(ACRES) = 358.70 AREA-AVERAGED Fm(INCH/HR) = 0.23
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.75
TOTAL AREA(ACRES) = 358.7 PEAK FLOW RATE(CFS) = 594.20
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.54

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.54 FLOW VELOCITY(FEET/SEC.) = 9.82
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12267.00 = 7146.43 FEET.

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FLOW PROCESS FROM NODE 12267.00 TO NODE 12268.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1232.47 DOWNSTREAM(FEET) = 1141.79
CHANNEL LENGTH THRU SUBAREA(FEET) = 2111.19 CHANNEL SLOPE = 0.0430
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.95
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.864
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS

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LAND USE            GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -         84.55    0.30    0.710    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.710
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 308.60
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.10
AVERAGE FLOW DEPTH(FEET) = 2.14 TRAVEL TIME(MIN.) = 3.50
Tc(MIN.) = 18.74
SUBAREA AREA(ACRES) = 84.55 SUBAREA RUNOFF(CFS) = 155.38
EFFECTIVE AREA(ACRES) = 198.33 AREA-AVERAGED Fm(INCH/HR) = 0.26

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LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 100.65 0.30 0.970 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.970  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 665.48  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.55  
 AVERAGE FLOW DEPTH(FEET) = 3.91 TRAVEL TIME(MIN.) = 3.69  
 Tc(MIN.) = 25.21  
 SUBAREA AREA(ACRES) = 100.65 SUBAREA RUNOFF(CFS) = 142.50  
 EFFECTIVE AREA(ACRES) = 459.35 AREA-AVERAGED Fm(INCH/HR) = 0.24  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.80  
 TOTAL AREA(ACRES) = 459.4 PEAK FLOW RATE(CFS) = 671.27  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.93

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.93 FLOW VELOCITY(FEET/SEC.) = 9.58  
 LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12268.00 = 9257.62 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12268.00 TO NODE 12269.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1141.79 DOWNSTREAM(FEET) = 1115.83  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1295.17 CHANNEL SLOPE = 0.0200  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.01  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.753  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 103.26 0.30 0.838 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.838  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 741.06  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.43  
 AVERAGE FLOW DEPTH(FEET) = 4.99 TRAVEL TIME(MIN.) = 2.91  
 Tc(MIN.) = 28.12  
 SUBAREA AREA(ACRES) = 103.26 SUBAREA RUNOFF(CFS) = 139.55  
 EFFECTIVE AREA(ACRES) = 562.61 AREA-AVERAGED Fm(INCH/HR) = 0.24  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.81  
 TOTAL AREA(ACRES) = 562.6 PEAK FLOW RATE(CFS) = 764.93  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.07

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 5.07 FLOW VELOCITY(FEET/SEC.) = 7.49  
 LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12269.00 = 10552.79 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12269.00 TO NODE 12269.50 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1115.83 DOWNSTREAM(FEET) = 1100.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1137.63 CHANNEL SLOPE = 0.0139  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.66  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.656  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 50.20 0.30 0.708 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.708  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 797.54  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.63  
 AVERAGE FLOW DEPTH(FEET) = 5.65 TRAVEL TIME(MIN.) = 2.86  
 Tc(MIN.) = 30.98  
 SUBAREA AREA(ACRES) = 50.20 SUBAREA RUNOFF(CFS) = 65.24  
 EFFECTIVE AREA(ACRES) = 612.81 AREA-AVERAGED Fm(INCH/HR) = 0.24  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.80  
 TOTAL AREA(ACRES) = 612.8 PEAK FLOW RATE(CFS) = 781.19  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.60

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 5.60 FLOW VELOCITY(FEET/SEC.) = 6.59  
 LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12269.50 = 11690.42 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12269.50 TO NODE 12270.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1100.00 DOWNSTREAM(FEET) = 1091.06  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1219.38 CHANNEL SLOPE = 0.0073  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 6.76  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.559  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 98.30 0.30 0.583 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.583  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 842.44  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.30  
 AVERAGE FLOW DEPTH(FEET) = 6.76 TRAVEL TIME(MIN.) = 3.83  
 Tc(MIN.) = 34.81  
 SUBAREA AREA(ACRES) = 98.30 SUBAREA RUNOFF(CFS) = 122.48  
 EFFECTIVE AREA(ACRES) = 711.11 AREA-AVERAGED Fm(INCH/HR) = 0.23  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.77  
 TOTAL AREA(ACRES) = 711.1 PEAK FLOW RATE(CFS) = 850.20  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 6.79  
END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 6.79 FLOW VELOCITY (FEET/SEC.) = 5.31  
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12270.00 = 12909.80 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12270.00 TO NODE 12271.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 1091.06 DOWNSTREAM (FEET) = 962.23  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1995.19 CHANNEL SLOPE = 0.0646  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 4.24  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.490

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	181.93	0.30	0.746	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.746

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 953.90

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.21

AVERAGE FLOW DEPTH (FEET) = 4.23 TRAVEL TIME (MIN.) = 2.72

Tc (MIN.) = 37.53

SUBAREA AREA (ACRES) = 181.93 SUBAREA RUNOFF (CFS) = 207.40

EFFECTIVE AREA (ACRES) = 893.04 AREA-AVERAGED Fm (INCH/HR) = 0.23

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.76

TOTAL AREA (ACRES) = 893.0 PEAK FLOW RATE (CFS) = 1013.50

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 4.36

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 4.36 FLOW VELOCITY (FEET/SEC.) = 12.41

LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12271.00 = 14904.99 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12271.00 TO NODE 12272.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 962.23 DOWNSTREAM (FEET) = 917.38  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1613.85 CHANNEL SLOPE = 0.0278  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.63

\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.421

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	181.79	0.30	0.910	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.910

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1107.44  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.32  
AVERAGE FLOW DEPTH (FEET) = 5.60 TRAVEL TIME (MIN.) = 2.89  
Tc (MIN.) = 40.42  
SUBAREA AREA (ACRES) = 181.79 SUBAREA RUNOFF (CFS) = 187.87  
EFFECTIVE AREA (ACRES) = 1074.83 AREA-AVERAGED Fm (INCH/HR) = 0.24  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.79  
TOTAL AREA (ACRES) = 1074.8 PEAK FLOW RATE (CFS) = 1145.73  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.70

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 5.70 FLOW VELOCITY (FEET/SEC.) = 9.40

LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12272.00 = 16518.84 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12272.00 TO NODE 12281.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 917.38 DOWNSTREAM (FEET) = 846.91  
CHANNEL LENGTH THRU SUBAREA (FEET) = 3182.34 CHANNEL SLOPE = 0.0221  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 6.12

\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.323

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	79.99	0.30	0.948	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.948

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1183.11

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.72

AVERAGE FLOW DEPTH (FEET) = 6.11 TRAVEL TIME (MIN.) = 6.08

Tc (MIN.) = 46.50

SUBAREA AREA (ACRES) = 79.99 SUBAREA RUNOFF (CFS) = 74.75

EFFECTIVE AREA (ACRES) = 1154.82 AREA-AVERAGED Fm (INCH/HR) = 0.24

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.80

TOTAL AREA (ACRES) = 1154.8 PEAK FLOW RATE (CFS) = 1145.73

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 6.02

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 6.02 FLOW VELOCITY (FEET/SEC.) = 8.64

LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12281.00 = 19701.18 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12272.00 TO NODE 12281.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 46.50  
 RAINFALL INTENSITY(INCH/HR) = 1.32  
 AREA-AVERAGED Fm(INCH/HR) = 0.24  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.80  
 EFFECTIVE STREAM AREA(ACRES) = 1154.82  
 TOTAL STREAM AREA(ACRES) = 1154.82  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 1145.73

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4883.43	31.49	1.643	0.30( 0.30)	1.00	3728.0	12211.00
1	5030.89	35.98	1.530	0.30( 0.30)	1.00	4212.3	12201.00
1	5041.63	40.17	1.425	0.30( 0.30)	1.00	4582.7	12111.00
1	5034.50	42.78	1.383	0.30( 0.30)	1.00	4829.6	12231.00
1	5023.65	45.56	1.338	0.30( 0.30)	1.00	5060.4	12101.10
1	4884.57	56.95	1.183	0.30( 0.30)	1.00	5884.2	12010.00
1	4502.09	64.31	1.118	0.30( 0.30)	1.00	6008.3	12000.00
2	1145.73	46.50	1.323	0.30( 0.24)	0.80	1154.8	12261.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5889.04	31.49	1.643	0.30( 0.29)	0.97	4509.9	12211.00
2	6086.87	35.98	1.530	0.30( 0.29)	0.96	5105.7	12201.00
3	6125.12	40.17	1.425	0.30( 0.29)	0.96	5580.2	12111.00
4	6147.22	42.78	1.383	0.30( 0.29)	0.96	5891.9	12231.00
5	6161.98	45.56	1.338	0.30( 0.29)	0.96	6191.8	12101.10
6	6157.86	46.50	1.323	0.30( 0.29)	0.96	6283.4	12261.00
7	5882.86	56.95	1.183	0.30( 0.29)	0.97	7039.0	12010.00
8	5431.34	64.31	1.118	0.30( 0.29)	0.97	7163.1	12000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 6161.98 Tc(MIN.) = 45.56  
 EFFECTIVE AREA(ACRES) = 6191.80 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA(ACRES) = 7163.1  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12281.00 = 40657.56 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12281.00 TO NODE 12282.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 846.91 DOWNSTREAM(FEET) = 835.60  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1561.00 CHANNEL SLOPE = 0.0072  
 GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 14.63  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.290  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 267.56 0.30 0.867 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.867  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6285.95  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.73  
 AVERAGE FLOW DEPTH(FEET) = 14.62 TRAVEL TIME(MIN.) = 2.98  
 Tc(MIN.) = 48.54  
 SUBAREA AREA(ACRES) = 267.56 SUBAREA RUNOFF(CFS) = 247.93  
 EFFECTIVE AREA(ACRES) = 6459.36 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA(ACRES) = 7430.6 PEAK FLOW RATE(CFS) = 6161.98  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 14.48

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 14.48 FLOW VELOCITY(FEET/SEC.) = 8.69  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12282.00 = 42218.56 FEET.

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 7430.6 TC(MIN.) = 48.54  
 EFFECTIVE AREA(ACRES) = 6459.36 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.959  
 PEAK FLOW RATE(CFS) = 6161.98

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5889.04	34.50	1.567	0.30( 0.29)	0.96	4777.5	12211.00
2	6086.87	38.96	1.454	0.30( 0.29)	0.96	5373.3	12201.00
3	6125.12	43.15	1.377	0.30( 0.29)	0.96	5847.8	12111.00
4	6147.22	45.76	1.335	0.30( 0.29)	0.96	6159.5	12231.00
5	6161.98	48.54	1.290	0.30( 0.29)	0.96	6459.4	12101.10
6	6157.86	49.48	1.274	0.30( 0.29)	0.96	6551.0	12261.00
7	5882.86	59.96	1.147	0.30( 0.29)	0.96	7306.6	12010.00
8	5431.34	67.39	1.097	0.30( 0.29)	0.96	7430.6	12000.00

=====

END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

-----  
FILE NAME: S23.DAT  
TIME/DATE OF STUDY: 11:58 04/03/2013  
=====

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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

---\*TIME-OF-CONCENTRATION MODEL\*---

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.059
- 2) 10.00; 3.304
- 3) 15.00; 2.561
- 4) 20.00; 2.152
- 5) 25.00; 1.872
- 6) 30.00; 1.681
- 7) 40.00; 1.428
- 8) 50.00; 1.266
- 9) 60.00; 1.147
- 10) 90.00; 0.946
- 11) 120.00; 0.816
- 12) 180.00; 0.687
- 13) 360.00; 0.499
- 14) 1440.00; 0.216

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12300.00 TO NODE 12301.00 IS CODE = 21  
-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 924.36  
ELEVATION DATA: UPSTREAM(FEET) = 1712.53 DOWNSTREAM(FEET) = 1490.12

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 14.417  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.648  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "GRASS"	-	6.66	0.30	1.000	0	14.42

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 14.07  
TOTAL AREA(ACRES) = 6.66 PEAK FLOW RATE(CFS) = 14.07

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12301.00 TO NODE 12302.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1490.12 DOWNSTREAM(FEET) = 1117.78  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1564.45 CHANNEL SLOPE = 0.2380  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.62  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.335  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	39.97	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 50.84  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.79  
AVERAGE FLOW DEPTH(FEET) = 0.58 TRAVEL TIME(MIN.) = 3.35  
Tc(MIN.) = 17.77  
SUBAREA AREA(ACRES) = 39.97 SUBAREA RUNOFF(CFS) = 73.20  
EFFECTIVE AREA(ACRES) = 46.63 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 46.6 PEAK FLOW RATE(CFS) = 85.40  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.79

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.79 FLOW VELOCITY(FEET/SEC.) = 9.33  
LONGEST FLOWPATH FROM NODE 12300.00 TO NODE 12302.00 = 2488.81 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12302.00 TO NODE 12320.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1117.78 DOWNSTREAM(FEET) = 780.80  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2216.41 CHANNEL SLOPE = 0.1520  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.16

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.051

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	51.51	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 126.04

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.13

AVERAGE FLOW DEPTH(FEET) = 1.13 TRAVEL TIME(MIN.) = 4.04

Tc(MIN.) = 21.81

SUBAREA AREA(ACRES) = 51.51 SUBAREA RUNOFF(CFS) = 81.16

EFFECTIVE AREA(ACRES) = 98.14 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 98.1 PEAK FLOW RATE(CFS) = 154.63

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.26

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.26 FLOW VELOCITY(FEET/SEC.) = 9.77

LONGEST FLOWPATH FROM NODE 12300.00 TO NODE 12320.00 = 4705.22 FEET.

-----  
\*\*\*\*\*  
FLOW PROCESS FROM NODE 12302.00 TO NODE 12320.00 IS CODE = 10  
-----

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

-----  
\*\*\*\*\*  
FLOW PROCESS FROM NODE 12282.00 TO NODE 12282.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<

PEAK FLOWRATE TABLE FILE NAME: S22.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5889.04	34.50	0.30( 0.29)	0.96	4777.5	12211.00
2	6086.87	38.96	0.30( 0.29)	0.96	5373.3	12201.00
3	6125.12	43.15	0.30( 0.29)	0.96	5847.8	12111.00
4	6147.22	45.76	0.30( 0.29)	0.96	6159.5	12231.00
5	6161.98	48.54	0.30( 0.29)	0.96	6459.4	12101.10
6	6157.86	49.48	0.30( 0.29)	0.96	6551.0	12261.00
7	5882.86	59.96	0.30( 0.29)	0.96	7306.6	12010.00
8	5431.34	67.39	0.30( 0.29)	0.96	7430.6	12000.00
TOTAL AREA(ACRES) =		7430.6				

\*\*\*\*\*

FLOW PROCESS FROM NODE 12282.00 TO NODE 12282.00 IS CODE = 14.0

-----  
>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<

-----  
MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5889.04	34.50	0.30( 0.29)	0.96	4777.5	12211.00
2	6086.87	38.96	0.30( 0.29)	0.96	5373.3	12201.00
3	6125.12	43.15	0.30( 0.29)	0.96	5847.8	12111.00
4	6147.22	45.76	0.30( 0.29)	0.96	6159.5	12231.00
5	6161.98	48.54	0.30( 0.29)	0.96	6459.4	12101.10
6	6157.86	49.48	0.30( 0.29)	0.96	6551.0	12261.00
7	5882.86	59.96	0.30( 0.29)	0.96	7306.6	12010.00
8	5431.34	67.39	0.30( 0.29)	0.96	7430.6	12000.00
TOTAL AREA(ACRES) =		7430.6				

\*\*\*\*\*

FLOW PROCESS FROM NODE 12282.00 TO NODE 12320.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 835.60 DOWNSTREAM(FEET) = 780.80  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1568.10 CHANNEL SLOPE = 0.0349  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.04

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.261

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	51.15	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6184.12

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.22

AVERAGE FLOW DEPTH(FEET) = 8.04 TRAVEL TIME(MIN.) = 1.84

Tc(MIN.) = 50.38

SUBAREA AREA(ACRES) = 51.15 SUBAREA RUNOFF(CFS) = 44.27

EFFECTIVE AREA(ACRES) = 6510.51 AREA-AVERAGED Fm(INCH/HR) = 0.29

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96

TOTAL AREA(ACRES) = 7481.8 PEAK FLOW RATE(CFS) = 6161.98

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.02

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.02 FLOW VELOCITY(FEET/SEC.) = 14.20

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12320.00 = 43786.66 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12302.00 TO NODE 12320.00 IS CODE = 11

-----  
>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5889.04	36.36	1.520	0.30 ( 0.29)	0.96	4828.6	12211.00
2	6086.87	40.81	1.415	0.30 ( 0.29)	0.96	5424.4	12201.00
3	6125.12	44.99	1.347	0.30 ( 0.29)	0.96	5898.9	12111.00
4	6147.22	47.60	1.305	0.30 ( 0.29)	0.96	6210.7	12231.00
5	6161.98	50.38	1.261	0.30 ( 0.29)	0.96	6510.5	12101.10
6	6157.86	51.32	1.250	0.30 ( 0.29)	0.96	6602.2	12261.00
7	5882.86	61.83	1.135	0.30 ( 0.29)	0.96	7357.7	12010.00
8	5431.34	69.29	1.085	0.30 ( 0.29)	0.96	7481.8	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12320.00 = 43786.66 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	154.63	21.81	2.051	0.30 ( 0.30)	1.00	98.1	12300.00

LONGEST FLOWPATH FROM NODE 12300.00 TO NODE 12320.00 = 4705.22 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5208.25	21.81	2.051	0.30 ( 0.29)	0.96	2994.7	12300.00
2	5996.82	36.36	1.520	0.30 ( 0.29)	0.96	4926.8	12211.00
3	6185.35	40.81	1.415	0.30 ( 0.29)	0.96	5522.6	12201.00
4	6217.61	44.99	1.347	0.30 ( 0.29)	0.96	5997.1	12111.00
5	6235.99	47.60	1.305	0.30 ( 0.29)	0.96	6308.8	12231.00
6	6246.91	50.38	1.261	0.30 ( 0.29)	0.96	6608.7	12101.10
7	6241.80	51.32	1.250	0.30 ( 0.29)	0.96	6700.3	12261.00
8	5956.60	61.83	1.135	0.30 ( 0.29)	0.96	7455.9	12010.00
9	5500.66	69.29	1.085	0.30 ( 0.29)	0.96	7579.9	12000.00

TOTAL AREA (ACRES) = 7579.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 6246.91 Tc(MIN.) = 50.379  
EFFECTIVE AREA(ACRES) = 6608.65 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
TOTAL AREA(ACRES) = 7579.9  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12320.00 = 43786.66 FEET.

\*\*\*\*\* FLOW PROCESS FROM NODE 12320.00 TO NODE 12321.00 IS CODE = 56 \*\*\*\*\*

FLOW PROCESS FROM NODE 12320.00 TO NODE 12321.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 780.80 DOWNSTREAM(FEET) = 761.66  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2102.41 CHANNEL SLOPE = 0.0091  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.32  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.214

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	180.82	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6321.28  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.74  
AVERAGE FLOW DEPTH(FEET) = 11.31 TRAVEL TIME(MIN.) = 4.01  
Tc(MIN.) = 54.39  
SUBAREA AREA(ACRES) = 180.82 SUBAREA RUNOFF(CFS) = 148.72  
EFFECTIVE AREA(ACRES) = 6789.47 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
TOTAL AREA(ACRES) = 7760.8 PEAK FLOW RATE(CFS) = 6246.91  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.24

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 11.24 FLOW VELOCITY(FEET/SEC.) = 8.72  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12321.00 = 45889.07 FEET.

\*\*\*\*\* FLOW PROCESS FROM NODE 12321.00 TO NODE 12322.00 IS CODE = 56 \*\*\*\*\*

FLOW PROCESS FROM NODE 12321.00 TO NODE 12322.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 761.66 DOWNSTREAM(FEET) = 710.30  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1916.13 CHANNEL SLOPE = 0.0268  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.70  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.185

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	217.17	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6333.37  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.99  
AVERAGE FLOW DEPTH(FEET) = 8.69 TRAVEL TIME(MIN.) = 2.46  
Tc(MIN.) = 56.84

SUBAREA AREA(ACRES) = 217.17 SUBAREA RUNOFF(CFS) = 172.90  
EFFECTIVE AREA(ACRES) = 7006.64 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
TOTAL AREA(ACRES) = 7977.9 PEAK FLOW RATE(CFS) = 6246.91

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.63

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.63 FLOW VELOCITY(FEET/SEC.) = 12.94  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12322.00 = 47805.20 FEET.

\*\*\*\*\* FLOW PROCESS FROM NODE 12322.00 TO NODE 12340.00 IS CODE = 56 \*\*\*\*\*

FLOW PROCESS FROM NODE 12322.00 TO NODE 12340.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<



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ELEVATION DATA: UPSTREAM(FEET) = 710.30 DOWNSTREAM(FEET) = 678.19
CHANNEL LENGTH THRU SUBAREA(FEET) = 1977.07 CHANNEL SLOPE = 0.0162
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.84
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.148
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE            GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -        194.67  0.30  0.999  -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.999
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6321.26
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.82
AVERAGE FLOW DEPTH(FEET) = 9.82 TRAVEL TIME(MIN.) = 3.05
Tc(MIN.) = 59.89
SUBAREA AREA(ACRES) = 194.67 SUBAREA RUNOFF(CFS) = 148.69
EFFECTIVE AREA(ACRES) = 7201.31 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 8172.6 PEAK FLOW RATE(CFS) = 6246.91
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.77

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 9.77 FLOW VELOCITY(FEET/SEC.) = 10.78
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12340.00 = 49782.27 FEET.

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*****
FLOW PROCESS FROM NODE 12322.00 TO NODE 12340.00 IS CODE = 1
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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
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TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 59.89
RAINFALL INTENSITY(INCH/HR) = 1.15
AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.96
EFFECTIVE STREAM AREA(ACRES) = 7201.31
TOTAL STREAM AREA(ACRES) = 8172.59
PEAK FLOW RATE(CFS) AT CONFLUENCE = 6246.91

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FLOW PROCESS FROM NODE 12330.00 TO NODE 12331.00 IS CODE = 21
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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
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INITIAL SUBAREA FLOW-LENGTH(FEET) = 994.42
ELEVATION DATA: UPSTREAM(FEET) = 1754.00 DOWNSTREAM(FEET) = 1530.30

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Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 15.046
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.557

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SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS   Tc
LAND USE            GROUP   (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"GRASS"              -        3.33  0.30  1.000  0  15.05
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 6.77
TOTAL AREA(ACRES) = 3.33 PEAK FLOW RATE(CFS) = 6.77

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*****
FLOW PROCESS FROM NODE 12331.00 TO NODE 12332.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 1530.30 DOWNSTREAM(FEET) = 1412.81
CHANNEL LENGTH THRU SUBAREA(FEET) = 946.66 CHANNEL SLOPE = 0.1241
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 0.57
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.316
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE            GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -        28.08  0.30  1.000  -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 32.36
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.36
AVERAGE FLOW DEPTH(FEET) = 0.54 TRAVEL TIME(MIN.) = 2.94
Tc(MIN.) = 17.99
SUBAREA AREA(ACRES) = 28.08 SUBAREA RUNOFF(CFS) = 50.96
EFFECTIVE AREA(ACRES) = 31.41 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 31.4 PEAK FLOW RATE(CFS) = 57.00
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 0.76

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.76 FLOW VELOCITY(FEET/SEC.) = 6.53
LONGEST FLOWPATH FROM NODE 12330.00 TO NODE 12332.00 = 1941.08 FEET.

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*****
FLOW PROCESS FROM NODE 12332.00 TO NODE 12333.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 1412.81 DOWNSTREAM(FEET) = 1235.19
CHANNEL LENGTH THRU SUBAREA(FEET) = 1959.37 CHANNEL SLOPE = 0.0907
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.13
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.000
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS

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LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 44.96 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 91.50  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.91  
 AVERAGE FLOW DEPTH(FEET) = 1.09 TRAVEL TIME(MIN.) = 4.73  
 Tc(MIN.) = 22.72  
 SUBAREA AREA(ACRES) = 44.96 SUBAREA RUNOFF(CFS) = 68.78  
 EFFECTIVE AREA(ACRES) = 76.37 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 76.4 PEAK FLOW RATE(CFS) = 116.83  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.25

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.25 FLOW VELOCITY(FEET/SEC.) = 7.49  
 LONGEST FLOWPATH FROM NODE 12330.00 TO NODE 12333.00 = 3900.45 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12333.00 TO NODE 12334.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 1235.19 DOWNSTREAM(FEET) = 1013.96  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1921.81 CHANNEL SLOPE = 0.1151  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.29  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.816  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	30.50	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 137.65  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.53  
 AVERAGE FLOW DEPTH(FEET) = 1.28 TRAVEL TIME(MIN.) = 3.76  
 Tc(MIN.) = 26.48  
 SUBAREA AREA(ACRES) = 30.50 SUBAREA RUNOFF(CFS) = 41.61  
 EFFECTIVE AREA(ACRES) = 106.87 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 106.9 PEAK FLOW RATE(CFS) = 145.78  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.32 FLOW VELOCITY(FEET/SEC.) = 8.70  
 LONGEST FLOWPATH FROM NODE 12330.00 TO NODE 12334.00 = 5822.26 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12334.00 TO NODE 12335.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1013.96 DOWNSTREAM(FEET) = 809.84  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2029.80 CHANNEL SLOPE = 0.1006  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.84  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.682  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	145.82	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 236.53  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.64  
 AVERAGE FLOW DEPTH(FEET) = 1.80 TRAVEL TIME(MIN.) = 3.51  
 Tc(MIN.) = 29.99  
 SUBAREA AREA(ACRES) = 145.82 SUBAREA RUNOFF(CFS) = 181.32  
 EFFECTIVE AREA(ACRES) = 252.69 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 252.7 PEAK FLOW RATE(CFS) = 314.21  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.11

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.11 FLOW VELOCITY(FEET/SEC.) = 10.48  
 LONGEST FLOWPATH FROM NODE 12330.00 TO NODE 12335.00 = 7852.06 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12335.00 TO NODE 12340.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 809.84 DOWNSTREAM(FEET) = 678.19  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1905.44 CHANNEL SLOPE = 0.0691  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.45  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.596  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	50.71	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 343.79  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.44  
 AVERAGE FLOW DEPTH(FEET) = 2.45 TRAVEL TIME(MIN.) = 3.37  
 Tc(MIN.) = 33.35  
 SUBAREA AREA(ACRES) = 50.71 SUBAREA RUNOFF(CFS) = 59.16  
 EFFECTIVE AREA(ACRES) = 303.40 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 303.4 PEAK FLOW RATE(CFS) = 353.97  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.49

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 2.49 FLOW VELOCITY (FEET/SEC.) = 9.49  
LONGEST FLOWPATH FROM NODE 12330.00 TO NODE 12340.00 = 9757.50 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12335.00 TO NODE 12340.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION (MIN.) = 33.35  
RAINFALL INTENSITY (INCH/HR) = 1.60  
AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA (ACRES) = 303.40  
TOTAL STREAM AREA (ACRES) = 303.40  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 353.97

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5208.25	31.76	1.636	0.30 (0.29)	0.97	3587.4	12300.00
1	5996.82	45.96	1.331	0.30 (0.29)	0.97	5519.4	12211.00
1	6185.35	50.34	1.262	0.30 (0.29)	0.96	6115.2	12201.00
1	6217.61	54.52	1.212	0.30 (0.29)	0.96	6589.7	12111.00
1	6235.99	57.12	1.181	0.30 (0.29)	0.96	6901.5	12231.00
1	6246.91	59.89	1.148	0.30 (0.29)	0.96	7201.3	12101.10
1	6241.80	60.84	1.141	0.30 (0.29)	0.96	7293.0	12261.00
1	5956.60	71.46	1.070	0.30 (0.29)	0.97	8048.5	12010.00
1	5500.66	79.14	1.019	0.30 (0.29)	0.97	8172.6	12000.00
2	353.97	33.35	1.596	0.30 (0.30)	1.00	303.4	12330.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5555.82	31.76	1.636	0.30 (0.29)	0.97	3876.4	12300.00
2	5650.28	33.35	1.596	0.30 (0.29)	0.97	4106.6	12330.00
3	6278.47	45.96	1.331	0.30 (0.29)	0.97	5822.8	12211.00
4	6448.06	50.34	1.262	0.30 (0.29)	0.97	6418.6	12201.00
5	6466.74	54.52	1.212	0.30 (0.29)	0.97	6893.1	12111.00
6	6476.66	57.12	1.181	0.30 (0.29)	0.97	7204.9	12231.00
7	6478.57	59.89	1.148	0.30 (0.29)	0.96	7504.7	12101.10
8	6471.57	60.84	1.141	0.30 (0.29)	0.96	7596.4	12261.00
9	6166.93	71.46	1.070	0.30 (0.29)	0.97	8351.9	12010.00
10	5696.95	79.14	1.019	0.30 (0.29)	0.97	8476.0	12000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 6478.57 Tc (MIN.) = 59.89  
EFFECTIVE AREA (ACRES) = 7504.71 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96

TOTAL AREA (ACRES) = 8476.0  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12340.00 = 49782.27 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12340.00 TO NODE 12341.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 678.19 DOWNSTREAM (FEET) = 630.21  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2827.23 CHANNEL SLOPE = 0.0170  
GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 9.94  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.119  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 317.33 0.30 0.999 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.999  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 6595.63  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.12  
AVERAGE FLOW DEPTH (FEET) = 9.92 TRAVEL TIME (MIN.) = 4.24  
Tc (MIN.) = 64.13

SUBAREA AREA (ACRES) = 317.33 SUBAREA RUNOFF (CFS) = 234.11  
EFFECTIVE AREA (ACRES) = 7822.04 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA (ACRES) = 8793.3 PEAK FLOW RATE (CFS) = 6478.57  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 9.84

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 9.84 FLOW VELOCITY (FEET/SEC.) = 11.06  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12341.00 = 52609.50 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12341.00 TO NODE 12342.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 630.21 DOWNSTREAM (FEET) = 601.66  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2006.47 CHANNEL SLOPE = 0.0142  
GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 10.31  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.098  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 124.13 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 6523.14  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.39

AVERAGE FLOW DEPTH (FEET) = 10.30 TRAVEL TIME (MIN.) = 3.22  
 Tc (MIN.) = 67.35  
 SUBAREA AREA (ACRES) = 124.13 SUBAREA RUNOFF (CFS) = 89.13  
 EFFECTIVE AREA (ACRES) = 7946.17 AREA-AVERAGED Fm (INCH/HR) = 0.29  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA (ACRES) = 8917.5 PEAK FLOW RATE (CFS) = 6478.57  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 10.27

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 10.27 FLOW VELOCITY (FEET/SEC.) = 10.37  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12342.00 = 54615.97 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12342.00 TO NODE 12425.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 601.66 DOWNSTREAM (FEET) = 572.29  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1884.49 CHANNEL SLOPE = 0.0156  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 10.08  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.078

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	96.92	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 6512.51  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.74  
 AVERAGE FLOW DEPTH (FEET) = 10.07 TRAVEL TIME (MIN.) = 2.93  
 Tc (MIN.) = 70.27  
 SUBAREA AREA (ACRES) = 96.92 SUBAREA RUNOFF (CFS) = 67.89  
 EFFECTIVE AREA (ACRES) = 8043.09 AREA-AVERAGED Fm (INCH/HR) = 0.29  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA (ACRES) = 9014.4 PEAK FLOW RATE (CFS) = 6478.57  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 10.05

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 10.05 FLOW VELOCITY (FEET/SEC.) = 10.73  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12425.00 = 56500.46 FEET.

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 9014.4 TC (MIN.) = 70.27  
 EFFECTIVE AREA (ACRES) = 8043.09 AREA-AVERAGED Fm (INCH/HR) = 0.29  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.967  
 PEAK FLOW RATE (CFS) = 6478.57

\*\* PEAK FLOW RATE TABLE \*\*

STREAM	Q	Tc	Intensity	Fp (Fm)	Ap	Ae	HEADWATER
--------	---	----	-----------	---------	----	----	-----------

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE
1	5555.82	42.56	1.386	0.30 ( 0.29)	0.97	4414.7 12300.00
2	5650.28	44.10	1.362	0.30 ( 0.29)	0.97	4644.9 12330.00
3	6278.47	56.43	1.190	0.30 ( 0.29)	0.97	6361.2 12211.00
4	6448.06	60.73	1.142	0.30 ( 0.29)	0.97	6957.0 12201.00
5	6466.74	64.90	1.114	0.30 ( 0.29)	0.97	7431.5 12111.00
6	6476.66	67.50	1.097	0.30 ( 0.29)	0.97	7743.2 12231.00
7	6478.57	70.27	1.078	0.30 ( 0.29)	0.97	8043.1 12101.10
8	6471.57	71.22	1.072	0.30 ( 0.29)	0.97	8134.7 12261.00
9	6166.93	81.98	1.000	0.30 ( 0.29)	0.97	8890.3 12010.00
10	5696.95	89.88	0.947	0.30 ( 0.29)	0.97	9014.4 12000.00

END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

-----  
FILE NAME: S24.DAT  
TIME/DATE OF STUDY: 11:58 04/03/2013  
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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

---\*TIME-OF-CONCENTRATION MODEL\*---

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.059
- 2) 10.00; 3.304
- 3) 15.00; 2.561
- 4) 20.00; 2.152
- 5) 25.00; 1.872
- 6) 30.00; 1.681
- 7) 40.00; 1.428
- 8) 50.00; 1.266
- 9) 60.00; 1.147
- 10) 90.00; 0.946
- 11) 120.00; 0.816
- 12) 180.00; 0.687
- 13) 360.00; 0.499
- 14) 1440.00; 0.216

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12400.00 TO NODE 12401.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 981.52  
ELEVATION DATA: UPSTREAM(FEET) = 2579.17 DOWNSTREAM(FEET) = 2249.14

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.811  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.738

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	8.82	0.30	1.000	0	13.81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 19.35  
TOTAL AREA(ACRES) = 8.82 PEAK FLOW RATE(CFS) = 19.35

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12401.00 TO NODE 12402.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2249.14 DOWNSTREAM(FEET) = 2103.89  
CHANNEL LENGTH THRU SUBAREA(FEET) = 975.11 CHANNEL SLOPE = 0.1490  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.81  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.475

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	46.29	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 64.75  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.25  
AVERAGE FLOW DEPTH(FEET) = 0.77 TRAVEL TIME(MIN.) = 2.24  
Tc(MIN.) = 16.05  
SUBAREA AREA(ACRES) = 46.29 SUBAREA RUNOFF(CFS) = 90.61  
EFFECTIVE AREA(ACRES) = 55.11 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 55.1 PEAK FLOW RATE(CFS) = 107.88  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.03

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.03 FLOW VELOCITY(FEET/SEC.) = 8.64  
LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12402.00 = 1956.63 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12402.00 TO NODE 12403.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2103.89 DOWNSTREAM(FEET) = 1771.34  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1880.50 CHANNEL SLOPE = 0.1768  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.25

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.225

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	54.97	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 155.57

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.27

AVERAGE FLOW DEPTH(FEET) = 1.22 TRAVEL TIME(MIN.) = 3.05

Tc(MIN.) = 19.10

SUBAREA AREA(ACRES) = 54.97 SUBAREA RUNOFF(CFS) = 95.25

EFFECTIVE AREA(ACRES) = 110.08 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 110.1 PEAK FLOW RATE(CFS) = 190.75

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.37

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.37 FLOW VELOCITY(FEET/SEC.) = 10.94

LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12403.00 = 3837.13 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12403.00 TO NODE 12404.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1771.34 DOWNSTREAM(FEET) = 1462.30  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2888.53 CHANNEL SLOPE = 0.1070  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.01

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.942

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	123.02	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 281.90

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.36

AVERAGE FLOW DEPTH(FEET) = 1.96 TRAVEL TIME(MIN.) = 4.65

Tc(MIN.) = 23.75

SUBAREA AREA(ACRES) = 123.02 SUBAREA RUNOFF(CFS) = 181.80

EFFECTIVE AREA(ACRES) = 233.10 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 233.1 PEAK FLOW RATE(CFS) = 344.48

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.18

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.18 FLOW VELOCITY(FEET/SEC.) = 11.01

LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12404.00 = 6725.66 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12404.00 TO NODE 12405.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1462.30 DOWNSTREAM(FEET) = 1308.28  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1925.25 CHANNEL SLOPE = 0.0800  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.94

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.809

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	241.71	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 508.75

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.09

AVERAGE FLOW DEPTH(FEET) = 2.90 TRAVEL TIME(MIN.) = 2.89

Tc(MIN.) = 26.64

SUBAREA AREA(ACRES) = 241.71 SUBAREA RUNOFF(CFS) = 328.33

EFFECTIVE AREA(ACRES) = 474.81 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 474.8 PEAK FLOW RATE(CFS) = 644.96

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.28

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.28 FLOW VELOCITY(FEET/SEC.) = 11.86

LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12405.00 = 8650.91 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12405.00 TO NODE 12406.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1308.28 DOWNSTREAM(FEET) = 1154.02  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1923.41 CHANNEL SLOPE = 0.0802  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.68

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.712

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	238.96	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 796.82  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.58  
 AVERAGE FLOW DEPTH(FEET) = 3.66 TRAVEL TIME(MIN.) = 2.55  
 Tc(MIN.) = 29.19  
 SUBAREA AREA(ACRES) = 238.96 SUBAREA RUNOFF(CFS) = 303.66  
 EFFECTIVE AREA(ACRES) = 713.77 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 713.8 PEAK FLOW RATE(CFS) = 907.03  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.91

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.91 FLOW VELOCITY(FEET/SEC.) = 13.02  
 LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12406.00 = 10574.32 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12406.00 TO NODE 12420.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1154.02 DOWNSTREAM(FEET) = 1073.11  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1607.69 CHANNEL SLOPE = 0.0503  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.48  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.640

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	58.02	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 942.03  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.11  
 AVERAGE FLOW DEPTH(FEET) = 4.48 TRAVEL TIME(MIN.) = 2.41  
 Tc(MIN.) = 31.60  
 SUBAREA AREA(ACRES) = 58.02 SUBAREA RUNOFF(CFS) = 70.00  
 EFFECTIVE AREA(ACRES) = 771.79 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 771.8 PEAK FLOW RATE(CFS) = 931.12  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.45

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.45 FLOW VELOCITY(FEET/SEC.) = 11.07  
 LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12420.00 = 12182.01 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12406.00 TO NODE 12420.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 31.60  
 RAINFALL INTENSITY(INCH/HR) = 1.64  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 771.79  
 TOTAL STREAM AREA(ACRES) = 771.79  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 931.12

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12410.00 TO NODE 12411.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 966.15  
 ELEVATION DATA: UPSTREAM(FEET) = 2215.42 DOWNSTREAM(FEET) = 1909.05

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.886  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.727  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	8.99	0.30	1.000	0	13.89

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 19.63  
 TOTAL AREA(ACRES) = 8.99 PEAK FLOW RATE(CFS) = 19.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12411.00 TO NODE 12412.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1909.05 DOWNSTREAM(FEET) = 1794.38  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 943.59 CHANNEL SLOPE = 0.1215  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.62  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.424

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.56	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 37.42  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.65  
 AVERAGE FLOW DEPTH(FEET) = 0.59 TRAVEL TIME(MIN.) = 2.78  
 Tc(MIN.) = 16.67  
 SUBAREA AREA(ACRES) = 18.56 SUBAREA RUNOFF(CFS) = 35.49  
 EFFECTIVE AREA(ACRES) = 27.55 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 27.5 PEAK FLOW RATE(CFS) = 52.68

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.73

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.73 FLOW VELOCITY (FEET/SEC.) = 6.32  
LONGEST FLOWPATH FROM NODE 12410.00 TO NODE 12412.00 = 1909.74 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12412.00 TO NODE 12413.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1794.38 DOWNSTREAM (FEET) = 1649.76  
CHANNEL LENGTH THRU SUBAREA (FEET) = 926.82 CHANNEL SLOPE = 0.1560  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.78  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.255

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	16.09	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 66.84  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.46  
AVERAGE FLOW DEPTH (FEET) = 0.78 TRAVEL TIME (MIN.) = 2.07  
Tc (MIN.) = 18.74  
SUBAREA AREA (ACRES) = 16.09 SUBAREA RUNOFF (CFS) = 28.31  
EFFECTIVE AREA (ACRES) = 43.64 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 43.6 PEAK FLOW RATE (CFS) = 76.79  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.84

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.84 FLOW VELOCITY (FEET/SEC.) = 7.80  
LONGEST FLOWPATH FROM NODE 12410.00 TO NODE 12413.00 = 2836.56 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12413.00 TO NODE 12414.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1649.76 DOWNSTREAM (FEET) = 1365.78  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1906.16 CHANNEL SLOPE = 0.1490  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.22  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.031

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	75.14	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 135.43  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.29  
AVERAGE FLOW DEPTH (FEET) = 1.18 TRAVEL TIME (MIN.) = 3.42  
Tc (MIN.) = 22.16

SUBAREA AREA (ACRES) = 75.14 SUBAREA RUNOFF (CFS) = 117.07  
EFFECTIVE AREA (ACRES) = 118.78 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 118.8 PEAK FLOW RATE (CFS) = 185.06  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.41

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.41 FLOW VELOCITY (FEET/SEC.) = 10.25  
LONGEST FLOWPATH FROM NODE 12410.00 TO NODE 12414.00 = 4742.72 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12414.00 TO NODE 12420.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1365.78 DOWNSTREAM (FEET) = 1073.11  
CHANNEL LENGTH THRU SUBAREA (FEET) = 3038.90 CHANNEL SLOPE = 0.0963  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.09  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.788

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	151.43	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 286.66  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.07  
AVERAGE FLOW DEPTH (FEET) = 2.03 TRAVEL TIME (MIN.) = 5.03  
Tc (MIN.) = 27.19  
SUBAREA AREA (ACRES) = 151.43 SUBAREA RUNOFF (CFS) = 202.84  
EFFECTIVE AREA (ACRES) = 270.21 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 270.2 PEAK FLOW RATE (CFS) = 361.95  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.30

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 2.30 FLOW VELOCITY (FEET/SEC.) = 10.77  
LONGEST FLOWPATH FROM NODE 12410.00 TO NODE 12420.00 = 7781.62 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12414.00 TO NODE 12420.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<



TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION (MIN.) = 27.19  
 RAINFALL INTENSITY (INCH/HR) = 1.79  
 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA (ACRES) = 270.21  
 TOTAL STREAM AREA (ACRES) = 270.21  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 361.95

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	931.12	31.60	1.640	0.30 (0.30)	1.00	771.8	12400.00
2	361.95	27.19	1.788	0.30 (0.30)	1.00	270.2	12410.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1251.44	27.19	1.788	0.30 (0.30)	1.00	934.3	12410.00
2	1257.11	31.60	1.640	0.30 (0.30)	1.00	1042.0	12400.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 1257.11 Tc (MIN.) = 31.60  
 EFFECTIVE AREA (ACRES) = 1042.00 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 1042.0  
 LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12420.00 = 12182.01 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12420.00 TO NODE 12421.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 1073.11 DOWNSTREAM (FEET) = 1005.32  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2235.12 CHANNEL SLOPE = 0.0303  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 6.12

\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.548

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	218.57	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1379.88

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.19

AVERAGE FLOW DEPTH (FEET) = 6.10 TRAVEL TIME (MIN.) = 3.65

Tc (MIN.) = 35.26

SUBAREA AREA (ACRES) = 218.57 SUBAREA RUNOFF (CFS) = 245.50

EFFECTIVE AREA (ACRES) = 1260.57 AREA-AVERAGED Fm (INCH/HR) = 0.30

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 1260.6 PEAK FLOW RATE (CFS) = 1415.90  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.18

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 6.18 FLOW VELOCITY (FEET/SEC.) = 10.26

LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12421.00 = 14417.13 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12421.00 TO NODE 12422.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 1005.32 DOWNSTREAM (FEET) = 879.13

CHANNEL LENGTH THRU SUBAREA (FEET) = 2800.31 CHANNEL SLOPE = 0.0451

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.87

\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.451

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	241.55	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1541.00

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.14

AVERAGE FLOW DEPTH (FEET) = 5.85 TRAVEL TIME (MIN.) = 3.84

Tc (MIN.) = 39.10

SUBAREA AREA (ACRES) = 241.55 SUBAREA RUNOFF (CFS) = 250.17

EFFECTIVE AREA (ACRES) = 1502.12 AREA-AVERAGED Fm (INCH/HR) = 0.30

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 1502.1 PEAK FLOW RATE (CFS) = 1555.75

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.88

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 5.88 FLOW VELOCITY (FEET/SEC.) = 12.17

LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12422.00 = 17217.44 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1584.54	34.68	1.563	0.30 (0.30)	1.00	1394.4	12410.00
2	1555.75	39.10	1.451	0.30 (0.30)	1.00	1502.1	12400.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 1584.54 Tc (MIN.) = 34.68

AREA-AVERAGED Fm (INCH/HR) = 0.30 AREA-AVERAGED Fp (INCH/HR) = 0.30

AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA (ACRES) = 1394.38

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12422.00 TO NODE 12423.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

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=====
ELEVATION DATA: UPSTREAM(FEET) = 879.13 DOWNSTREAM(FEET) = 815.17
CHANNEL LENGTH THRU SUBAREA(FEET) = 1918.90 CHANNEL SLOPE = 0.0333
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.53
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.490
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/   SCS SOIL  AREA      Fp      Ap   SCS
    LAND USE          GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED         -      151.63   0.30   1.000   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1665.71
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.09
AVERAGE FLOW DEPTH(FEET) = 6.52 TRAVEL TIME(MIN.) = 2.88
Tc(MIN.) = 37.57
SUBAREA AREA(ACRES) = 151.63 SUBAREA RUNOFF(CFS) = 162.35
EFFECTIVE AREA(ACRES) = 1546.01 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 1653.8 PEAK FLOW RATE(CFS) = 1655.31
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.50

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 6.50 FLOW VELOCITY(FEET/SEC.) = 11.06
LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12423.00 = 19136.34 FEET.

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** PEAK FLOW RATE TABLE **
STREAM      Q      Tc  Intensity  Fp(Fm)    Ap    Ae    HEADWATER
NUMBER     (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1         1655.31 37.57  1.490 0.30( 0.30) 1.00 1546.0 12410.00
2         1630.66 42.00  1.396 0.30( 0.30) 1.00 1653.8 12400.00
NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 1655.31 Tc(MIN.) = 37.57
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 1546.01

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FLOW PROCESS FROM NODE 12423.00 TO NODE 12424.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 815.17 DOWNSTREAM(FEET) = 696.54
CHANNEL LENGTH THRU SUBAREA(FEET) = 2870.82 CHANNEL SLOPE = 0.0413
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.30
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.403
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/   SCS SOIL  AREA      Fp      Ap   SCS
    LAND USE          GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED         -      122.40   0.30   1.000   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1716.08

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TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.10
AVERAGE FLOW DEPTH(FEET) = 6.28 TRAVEL TIME(MIN.) = 3.95
Tc(MIN.) = 41.52
SUBAREA AREA(ACRES) = 122.40 SUBAREA RUNOFF(CFS) = 121.56
EFFECTIVE AREA(ACRES) = 1668.41 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 1776.2 PEAK FLOW RATE(CFS) = 1656.91
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.18

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 6.18 FLOW VELOCITY(FEET/SEC.) = 11.98
LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12424.00 = 22007.16 FEET.

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** PEAK FLOW RATE TABLE **
STREAM      Q      Tc  Intensity  Fp(Fm)    Ap    Ae    HEADWATER
NUMBER     (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1         1656.91 41.52  1.403 0.30( 0.30) 1.00 1668.4 12410.00
2         1648.45 45.98  1.331 0.30( 0.30) 1.00 1776.2 12400.00
NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 1656.91 Tc(MIN.) = 41.52
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 1668.41

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*****
FLOW PROCESS FROM NODE 12424.00 TO NODE 12425.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 696.54 DOWNSTREAM(FEET) = 572.29
CHANNEL LENGTH THRU SUBAREA(FEET) = 3680.45 CHANNEL SLOPE = 0.0338
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.57
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.315
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/   SCS SOIL  AREA      Fp      Ap   SCS
    LAND USE          GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED         -      96.54   0.30   1.000   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1701.00
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.20
AVERAGE FLOW DEPTH(FEET) = 6.57 TRAVEL TIME(MIN.) = 5.48
Tc(MIN.) = 47.00
SUBAREA AREA(ACRES) = 96.54 SUBAREA RUNOFF(CFS) = 88.17
EFFECTIVE AREA(ACRES) = 1764.95 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 1872.7 PEAK FLOW RATE(CFS) = 1656.91
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.49

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 6.49 FLOW VELOCITY(FEET/SEC.) = 11.12

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LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12425.00 = 25687.61 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1656.91	47.00	1.315	0.30 ( 0.30)	1.00	1764.9	12410.00
2	1648.45	51.47	1.249	0.30 ( 0.30)	1.00	1872.7	12400.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1656.91 Tc(MIN.) = 47.00  
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 1764.95

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1872.7 TC(MIN.) = 47.00  
EFFECTIVE AREA(ACRES) = 1764.95 AREA-AVERAGED Fm(INCH/HR)= 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.000  
PEAK FLOW RATE(CFS) = 1656.91

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1656.91	47.00	1.315	0.30 ( 0.30)	1.00	1764.9	12410.00
2	1648.45	51.47	1.249	0.30 ( 0.30)	1.00	1872.7	12400.00

=====

END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

-----  
FILE NAME: S25.DAT  
TIME/DATE OF STUDY: 11:59 04/03/2013  
=====

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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

---\*TIME-OF-CONCENTRATION MODEL\*---

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.550
- 2) 10.00; 3.536
- 3) 15.00; 2.697
- 4) 20.00; 2.249
- 5) 25.00; 1.940
- 6) 30.00; 1.746
- 7) 40.00; 1.476
- 8) 50.00; 1.315
- 9) 60.00; 1.216
- 10) 90.00; 1.012
- 11) 120.00; 0.882
- 12) 180.00; 0.762
- 13) 360.00; 0.568
- 14) 1440.00; 0.251

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12500.00 TO NODE 12501.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 927.04  
ELEVATION DATA: UPSTREAM(FEET) = 1638.22 DOWNSTREAM(FEET) = 1356.00

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.770  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.903

SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)

NATURAL FAIR COVER  
"OPEN BRUSH" - 8.89 0.30 1.000 0 13.77  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 20.83  
TOTAL AREA(ACRES) = 8.89 PEAK FLOW RATE(CFS) = 20.83

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12501.00 TO NODE 12502.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1356.00 DOWNSTREAM(FEET) = 1203.37  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1004.73 CHANNEL SLOPE = 0.1519  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.65  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.575

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

USER-DEFINED - 24.30 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 45.79  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.47  
AVERAGE FLOW DEPTH(FEET) = 0.63 TRAVEL TIME(MIN.) = 2.59  
Tc(MIN.) = 16.36

SUBAREA AREA(ACRES) = 24.30 SUBAREA RUNOFF(CFS) = 49.76  
EFFECTIVE AREA(ACRES) = 33.19 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 33.2 PEAK FLOW RATE(CFS) = 67.97  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.79

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.79 FLOW VELOCITY(FEET/SEC.) = 7.42  
LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12502.00 = 1931.77 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12502.00 TO NODE 12503.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1203.37 DOWNSTREAM(FEET) = 987.23  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1884.62 CHANNEL SLOPE = 0.1147  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.40  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.252

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	90.42	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 147.76

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.71

AVERAGE FLOW DEPTH(FEET) = 1.34 TRAVEL TIME(MIN.) = 3.61

Tc(MIN.) = 19.96

SUBAREA AREA(ACRES) = 90.42 SUBAREA RUNOFF(CFS) = 158.87

EFFECTIVE AREA(ACRES) = 123.61 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 123.6 PEAK FLOW RATE(CFS) = 217.19

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.66

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.66 FLOW VELOCITY(FEET/SEC.) = 9.83

LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12503.00 = 3816.39 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12503.00 TO NODE 12504.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 987.23 DOWNSTREAM(FEET) = 870.07  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1478.57 CHANNEL SLOPE = 0.0792  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.16  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.088

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	84.07	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 284.89

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.36

AVERAGE FLOW DEPTH(FEET) = 2.13 TRAVEL TIME(MIN.) = 2.63

Tc(MIN.) = 22.60

SUBAREA AREA(ACRES) = 84.07 SUBAREA RUNOFF(CFS) = 135.32

EFFECTIVE AREA(ACRES) = 207.68 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 207.7 PEAK FLOW RATE(CFS) = 334.28

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.32 FLOW VELOCITY(FEET/SEC.) = 9.82

LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12504.00 = 5294.96 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12504.00 TO NODE 12505.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 870.07 DOWNSTREAM(FEET) = 729.02  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1915.52 CHANNEL SLOPE = 0.0736  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.60  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.909

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	79.84	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 392.12

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.01

AVERAGE FLOW DEPTH(FEET) = 2.58 TRAVEL TIME(MIN.) = 3.19

Tc(MIN.) = 25.79

SUBAREA AREA(ACRES) = 79.84 SUBAREA RUNOFF(CFS) = 115.64

EFFECTIVE AREA(ACRES) = 287.52 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 287.5 PEAK FLOW RATE(CFS) = 416.44

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.67

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.67 FLOW VELOCITY(FEET/SEC.) = 10.18

LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12505.00 = 7210.48 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12505.00 TO NODE 12520.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 729.02 DOWNSTREAM(FEET) = 549.92  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2961.35 CHANNEL SLOPE = 0.0605  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.00  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.724

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	78.77	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 466.94  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 9.79  
 AVERAGE FLOW DEPTH( FEET) = 2.99 TRAVEL TIME( MIN.) = 5.04  
 Tc( MIN.) = 30.83  
 SUBAREA AREA( ACRES) = 78.77 SUBAREA RUNOFF( CFS) = 100.94  
 EFFECTIVE AREA( ACRES) = 366.29 AREA-AVERAGED Fm( INCH/HR) = 0.30  
 AREA-AVERAGED Fp( INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA( ACRES) = 366.3 PEAK FLOW RATE( CFS) = 469.39  
 GIVEN CHANNEL BASE( FEET) = 10.00 CHANNEL FREEBOARD( FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT( FEET) = 2.99

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH( FEET) = 2.99 FLOW VELOCITY( FEET/SEC.) = 9.81  
 LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12520.00 = 10171.83 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12505.00 TO NODE 12520.00 IS CODE = 10  
 -----

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

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12342.00 TO NODE 12425.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S23.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5555.82	42.56	0.30 ( 0.29)	0.97	4414.7	12300.00
2	5650.28	44.10	0.30 ( 0.29)	0.97	4644.9	12330.00
3	6278.47	56.43	0.30 ( 0.29)	0.97	6361.2	12211.00
4	6448.06	60.73	0.30 ( 0.29)	0.97	6957.0	12201.00
5	6466.74	64.90	0.30 ( 0.29)	0.97	7431.5	12111.00
6	6476.66	67.50	0.30 ( 0.29)	0.97	7743.2	12231.00
7	6478.57	70.27	0.30 ( 0.29)	0.97	8043.1	12101.10
8	6471.57	71.22	0.30 ( 0.29)	0.97	8134.7	12261.00
9	6166.93	81.98	0.30 ( 0.29)	0.97	8890.3	12010.00
10	5696.95	89.88	0.30 ( 0.29)	0.97	9014.4	12000.00
TOTAL AREA (ACRES) =						9014.4

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12424.00 TO NODE 12425.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S24.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1656.91	47.00	0.30 ( 0.30)	1.00	1764.9	12410.00
2	1648.45	51.47	0.30 ( 0.30)	1.00	1872.7	12400.00
TOTAL AREA (ACRES) =						1872.7

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12424.00 TO NODE 12425.00 IS CODE = 14.0  
 -----

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1656.91	47.00	0.30 ( 0.30)	1.00	1764.9	12410.00
2	1648.45	51.47	0.30 ( 0.30)	1.00	1872.7	12400.00
TOTAL AREA (ACRES) =						1872.7

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12342.00 TO NODE 12425.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1656.91	47.00	1.363	0.30 ( 0.30)	1.00	1764.9	12410.00
2	1648.45	51.47	1.300	0.30 ( 0.30)	1.00	1872.7	12400.00
LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12425.00 = 25687.61 FEET.							

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5555.82	42.56	1.435	0.30 ( 0.29)	0.97	4414.7	12300.00
2	5650.28	44.10	1.410	0.30 ( 0.29)	0.97	4644.9	12330.00
3	6278.47	56.43	1.251	0.30 ( 0.29)	0.97	6361.2	12211.00
4	6448.06	60.73	1.211	0.30 ( 0.29)	0.97	6957.0	12201.00
5	6466.74	64.90	1.183	0.30 ( 0.29)	0.97	7431.5	12111.00
6	6476.66	67.50	1.165	0.30 ( 0.29)	0.97	7743.2	12231.00
7	6478.57	70.27	1.146	0.30 ( 0.29)	0.97	8043.1	12101.10
8	6471.57	71.22	1.140	0.30 ( 0.29)	0.97	8134.7	12261.00
9	6166.93	81.98	1.067	0.30 ( 0.29)	0.97	8890.3	12010.00
10	5696.95	89.88	1.013	0.30 ( 0.29)	0.97	9014.4	12000.00
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12425.00 = 56500.46 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7157.53	42.56	1.435	0.30 ( 0.29)	0.98	6013.1	12300.00
2	7273.52	44.10	1.410	0.30 ( 0.29)	0.98	6301.1	12330.00
3	7454.83	47.00	1.363	0.30 ( 0.29)	0.98	6813.2	12410.00
4	7674.30	51.47	1.300	0.30 ( 0.29)	0.98	7543.7	12400.00
5	7846.28	56.43	1.251	0.30 ( 0.29)	0.98	8233.9	12211.00
6	7949.59	60.73	1.211	0.30 ( 0.29)	0.98	8829.7	12201.00
7	7921.59	64.90	1.183	0.30 ( 0.29)	0.97	9304.2	12111.00
8	7902.46	67.50	1.165	0.30 ( 0.29)	0.97	9615.9	12231.00
9	7873.35	70.27	1.146	0.30 ( 0.29)	0.97	9915.8	12101.10
10	7855.69	71.22	1.140	0.30 ( 0.29)	0.97	10007.4	12261.00
11	7430.70	81.98	1.067	0.30 ( 0.29)	0.98	10763.0	12010.00
12	6872.29	89.88	1.013	0.30 ( 0.29)	0.98	10887.1	12000.00
TOTAL AREA (ACRES) =							10887.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 7949.59 Tc(MIN.) = 60.730  
 EFFECTIVE AREA(ACRES) = 8829.71 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98  
 TOTAL AREA(ACRES) = 10887.1  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12425.00 = 56500.46 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12425.00 TO NODE 12520.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 572.29 DOWNSTREAM(FEET) = 549.92  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1724.25 CHANNEL SLOPE = 0.0130  
 GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 9.81  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.192  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 117.96 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7996.94  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.28  
 AVERAGE FLOW DEPTH(FEET) = 9.80 TRAVEL TIME(MIN.) = 2.80  
 Tc(MIN.) = 63.53

SUBAREA AREA(ACRES) = 117.96 SUBAREA RUNOFF(CFS) = 94.70  
 EFFECTIVE AREA(ACRES) = 8947.67 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98  
 TOTAL AREA(ACRES) = 11005.0 PEAK FLOW RATE(CFS) = 7949.59  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 9.77

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 9.77 FLOW VELOCITY(FEET/SEC.) = 10.26  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12520.00 = 58224.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7157.53	45.44	1.388	0.30( 0.29)	0.98	6131.1	12300.00
2	7273.52	46.97	1.364	0.30( 0.29)	0.98	6419.0	12330.00
3	7454.83	49.84	1.317	0.30( 0.29)	0.98	6931.2	12410.00
4	7674.30	54.29	1.272	0.30( 0.29)	0.98	7661.7	12400.00
5	7846.28	59.23	1.223	0.30( 0.29)	0.98	8351.8	12211.00
6	7949.59	63.53	1.192	0.30( 0.29)	0.98	8947.7	12201.00
7	7921.59	67.70	1.164	0.30( 0.29)	0.97	9422.2	12111.00
8	7902.46	70.30	1.146	0.30( 0.29)	0.97	9733.9	12231.00
9	7873.35	73.08	1.127	0.30( 0.29)	0.97	10033.7	12101.10
10	7855.69	74.03	1.121	0.30( 0.29)	0.97	10125.4	12261.00
11	7430.70	84.83	1.047	0.30( 0.29)	0.98	10881.0	12010.00
12	7006.79	92.80	1.000	0.30( 0.29)	0.98	11005.0	12000.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 7949.59 Tc(MIN.) = 63.53  
 AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 8947.67

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12505.00 TO NODE 12520.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7157.53	45.44	1.388	0.30( 0.29)	0.98	6131.1	12300.00
2	7273.52	46.97	1.364	0.30( 0.29)	0.98	6419.0	12330.00
3	7454.83	49.84	1.317	0.30( 0.29)	0.98	6931.2	12410.00
4	7674.30	54.29	1.272	0.30( 0.29)	0.98	7661.7	12400.00
5	7846.28	59.23	1.223	0.30( 0.29)	0.98	8351.8	12211.00
6	7949.59	63.53	1.192	0.30( 0.29)	0.98	8947.7	12201.00
7	7921.59	67.70	1.164	0.30( 0.29)	0.97	9422.2	12111.00
8	7902.46	70.30	1.146	0.30( 0.29)	0.97	9733.9	12231.00
9	7873.35	73.08	1.127	0.30( 0.29)	0.97	10033.7	12101.10
10	7855.69	74.03	1.121	0.30( 0.29)	0.97	10125.4	12261.00
11	7430.70	84.83	1.047	0.30( 0.29)	0.98	10881.0	12010.00
12	7006.79	92.80	1.000	0.30( 0.29)	0.98	11005.0	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12520.00 = 58224.71 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	469.39	30.83	1.724	0.30( 0.30)	1.00	366.3	12500.00

LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12520.00 = 10171.83 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6814.50	30.83	1.724	0.30( 0.29)	0.98	4525.5	12500.00
2	7516.29	45.44	1.388	0.30( 0.29)	0.98	6497.4	12300.00
3	7624.15	46.97	1.364	0.30( 0.29)	0.98	6785.3	12330.00
4	7790.13	49.84	1.317	0.30( 0.29)	0.98	7297.5	12410.00
5	7994.80	54.29	1.272	0.30( 0.29)	0.98	8028.0	12400.00
6	8150.71	59.23	1.223	0.30( 0.29)	0.98	8718.1	12211.00
7	8243.64	63.53	1.192	0.30( 0.29)	0.98	9314.0	12201.00
8	8206.30	67.70	1.164	0.30( 0.29)	0.98	9788.4	12111.00
9	8181.35	70.30	1.146	0.30( 0.29)	0.98	10100.2	12231.00
10	8146.02	73.08	1.127	0.30( 0.29)	0.97	10400.0	12101.10
11	8126.24	74.03	1.121	0.30( 0.29)	0.97	10491.7	12261.00
12	7677.07	84.83	1.047	0.30( 0.29)	0.98	11247.2	12010.00
13	7237.60	92.80	1.000	0.30( 0.29)	0.98	11371.3	12000.00

TOTAL AREA(ACRES) = 11371.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 8243.64 Tc(MIN.) = 63.526  
 EFFECTIVE AREA(ACRES) = 9313.96 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98  
 TOTAL AREA(ACRES) = 11371.3  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12520.00 = 58224.71 FEET.

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FLOW PROCESS FROM NODE 12520.00 TO NODE 12521.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 549.92 DOWNSTREAM(FEET) = 525.43
CHANNEL LENGTH THRU SUBAREA(FEET) = 1934.41 CHANNEL SLOPE = 0.0127
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 10.05
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.171
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 85.91 0.30 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8277.30
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.29
AVERAGE FLOW DEPTH(FEET) = 10.04 TRAVEL TIME(MIN.) = 3.13
Tc(MIN.) = 66.66
SUBAREA AREA(ACRES) = 85.91 SUBAREA RUNOFF(CFS) = 67.32
EFFECTIVE AREA(ACRES) = 9399.87 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 11457.2 PEAK FLOW RATE(CFS) = 8243.64
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 10.02

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 10.02 FLOW VELOCITY(FEET/SEC.) = 10.27
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12521.00 = 60159.12 FEET.

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\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6814.50	34.13	1.635	0.30( 0.29)	0.98	4611.4	12500.00
2	7516.29	48.66	1.336	0.30( 0.29)	0.98	6583.3	12300.00
3	7624.15	50.17	1.313	0.30( 0.29)	0.98	6871.2	12330.00
4	7790.13	53.03	1.285	0.30( 0.29)	0.98	7383.4	12410.00
5	7994.80	57.45	1.241	0.30( 0.29)	0.98	8113.9	12400.00
6	8150.71	62.38	1.200	0.30( 0.29)	0.98	8804.0	12211.00
7	8243.64	66.66	1.171	0.30( 0.29)	0.98	9399.9	12201.00
8	8206.30	70.84	1.142	0.30( 0.29)	0.98	9874.4	12111.00
9	8181.35	73.44	1.125	0.30( 0.29)	0.98	10186.1	12231.00
10	8146.02	76.22	1.106	0.30( 0.29)	0.97	10485.9	12101.10
11	8126.24	77.18	1.099	0.30( 0.29)	0.97	10577.6	12261.00
12	7677.07	88.03	1.026	0.30( 0.29)	0.98	11333.2	12010.00
13	7237.60	96.05	0.986	0.30( 0.29)	0.98	11457.2	12000.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 8243.64 Tc(MIN.) = 66.66  
 AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 9399.87

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FLOW PROCESS FROM NODE 12521.00 TO NODE 12522.00 IS CODE = 56

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 525.43 DOWNSTREAM(FEET) = 490.87
CHANNEL LENGTH THRU SUBAREA(FEET) = 3335.01 CHANNEL SLOPE = 0.0104
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 10.71
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.131
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 539.82 0.30 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8445.64
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.62
AVERAGE FLOW DEPTH(FEET) = 10.69 TRAVEL TIME(MIN.) = 5.78
Tc(MIN.) = 72.44
SUBAREA AREA(ACRES) = 539.82 SUBAREA RUNOFF(CFS) = 403.97
EFFECTIVE AREA(ACRES) = 9939.69 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 11997.0 PEAK FLOW RATE(CFS) = 8243.64
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 10.56

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 10.56 FLOW VELOCITY(FEET/SEC.) = 9.56
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12522.00 = 63494.13 FEET.

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\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6814.50	40.20	1.473	0.30( 0.30)	0.98	5151.3	12500.00
2	7516.29	54.58	1.269	0.30( 0.30)	0.98	7123.1	12300.00
3	7624.15	56.06	1.255	0.30( 0.29)	0.98	7411.1	12330.00
4	7790.13	58.89	1.227	0.30( 0.29)	0.98	7923.2	12410.00
5	7994.80	63.28	1.194	0.30( 0.29)	0.98	8653.7	12400.00
6	8150.71	68.17	1.160	0.30( 0.29)	0.98	9343.9	12211.00
7	8243.64	72.44	1.131	0.30( 0.29)	0.98	9939.7	12201.00
8	8206.30	76.62	1.103	0.30( 0.29)	0.98	10414.2	12111.00
9	8181.35	79.23	1.085	0.30( 0.29)	0.98	10725.9	12231.00
10	8146.02	82.02	1.066	0.30( 0.29)	0.98	11025.8	12101.10
11	8126.24	82.98	1.060	0.30( 0.29)	0.98	11117.4	12261.00
12	7677.07	93.93	0.995	0.30( 0.29)	0.98	11873.0	12010.00
13	7237.60	102.05	0.960	0.30( 0.29)	0.98	11997.0	12000.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 8243.64 Tc(MIN.) = 72.44  
 AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 9939.69

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FLOW PROCESS FROM NODE 12522.00 TO NODE 12523.00 IS CODE = 56

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

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>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 490.87 DOWNSTREAM(FEET) = 467.63
CHANNEL LENGTH THRU SUBAREA(FEET) = 1961.26 CHANNEL SLOPE = 0.0118
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.28
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.109
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 321.58 0.30 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8360.78
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.07
AVERAGE FLOW DEPTH(FEET) = 10.27 TRAVEL TIME(MIN.) = 3.25
Tc(MIN.) = 75.68
SUBAREA AREA(ACRES) = 321.58 SUBAREA RUNOFF(CFS) = 234.28
EFFECTIVE AREA(ACRES) = 10261.27 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 12318.6 PEAK FLOW RATE(CFS) = 8243.64
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.20

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 10.20 FLOW VELOCITY(FEET/SEC.) = 10.03
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12523.00 = 65455.39 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 13 rows of data.

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 8243.64 Tc(MIN.) = 75.68
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 10261.27

FLOW PROCESS FROM NODE 12523.00 TO NODE 12524.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 467.63 DOWNSTREAM(FEET) = 436.35
CHANNEL LENGTH THRU SUBAREA(FEET) = 2841.85 CHANNEL SLOPE = 0.0110
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.47
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.077
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 298.62 0.30 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8348.01
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.80
AVERAGE FLOW DEPTH(FEET) = 10.46 TRAVEL TIME(MIN.) = 4.83
Tc(MIN.) = 80.51
SUBAREA AREA(ACRES) = 298.62 SUBAREA RUNOFF(CFS) = 208.74
EFFECTIVE AREA(ACRES) = 10559.89 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 12617.2 PEAK FLOW RATE(CFS) = 8243.64
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.39

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 10.39 FLOW VELOCITY(FEET/SEC.) = 9.77
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12524.00 = 68297.24 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 13 rows of data.

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 8243.64 Tc(MIN.) = 80.51
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 10559.89

FLOW PROCESS FROM NODE 12524.00 TO NODE 12525.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 436.35 DOWNSTREAM(FEET) = 415.23
CHANNEL LENGTH THRU SUBAREA(FEET) = 2812.14 CHANNEL SLOPE = 0.0075

GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 11.54  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.039  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 251.20 0.30 0.997 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.997  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 8327.33  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.54  
 AVERAGE FLOW DEPTH (FEET) = 11.53 TRAVEL TIME (MIN.) = 5.49  
 Tc (MIN.) = 86.00  
 SUBAREA AREA (ACRES) = 251.20 SUBAREA RUNOFF (CFS) = 167.37  
 EFFECTIVE AREA (ACRES) = 10811.09 AREA-AVERAGED Fm (INCH/HR) = 0.29  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98  
 TOTAL AREA (ACRES) = 12868.4 PEAK FLOW RATE (CFS) = 8243.64  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 11.47

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 11.47 FLOW VELOCITY (FEET/SEC.) = 8.51  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12525.00 = 71109.38 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6814.50	54.48	1.270	0.30 ( 0.30)	0.99	6022.7	12500.00
2	7516.29	68.49	1.158	0.30 ( 0.30)	0.99	7994.5	12300.00
3	7624.15	69.92	1.149	0.30 ( 0.30)	0.98	8282.5	12330.00
4	7790.13	72.66	1.130	0.30 ( 0.30)	0.98	8794.6	12410.00
5	7994.80	76.96	1.101	0.30 ( 0.29)	0.98	9525.1	12400.00
6	8150.71	81.77	1.068	0.30 ( 0.29)	0.98	10215.3	12211.00
7	8243.64	86.00	1.039	0.30 ( 0.29)	0.98	10811.1	12201.00
8	8206.30	90.21	1.011	0.30 ( 0.29)	0.98	11285.6	12111.00
9	8181.35	92.82	1.000	0.30 ( 0.29)	0.98	11597.3	12231.00
10	8146.02	95.63	0.988	0.30 ( 0.29)	0.98	11897.2	12101.10
11	8126.24	96.60	0.984	0.30 ( 0.29)	0.98	11988.8	12261.00
12	7677.07	107.77	0.935	0.30 ( 0.29)	0.98	12744.4	12010.00
13	7237.60	116.12	0.899	0.30 ( 0.29)	0.98	12868.4	12000.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 8243.64 Tc (MIN.) = 86.00  
 AREA-AVERAGED Fm (INCH/HR) = 0.29 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA (ACRES) = 10811.09

\*\*\*\*\*

FLOW PROCESS FROM NODE 12525.00 TO NODE 12526.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 415.23 DOWNSTREAM (FEET) = 380.28  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2934.09 CHANNEL SLOPE = 0.0119  
 GIVEN CHANNEL BASE (FEET) = 100.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 7.31  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.005  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 247.71 0.30 0.987 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.987  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 8322.72  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.82  
 AVERAGE FLOW DEPTH (FEET) = 7.30 TRAVEL TIME (MIN.) = 5.55  
 Tc (MIN.) = 91.55  
 SUBAREA AREA (ACRES) = 247.71 SUBAREA RUNOFF (CFS) = 158.17  
 EFFECTIVE AREA (ACRES) = 11058.80 AREA-AVERAGED Fm (INCH/HR) = 0.29  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98  
 TOTAL AREA (ACRES) = 13116.2 PEAK FLOW RATE (CFS) = 8243.64  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 100.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 7.27

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 7.27 FLOW VELOCITY (FEET/SEC.) = 8.79  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12526.00 = 74043.48 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6814.50	60.37	1.213	0.30 ( 0.30)	0.99	6270.4	12500.00
2	7516.29	74.19	1.119	0.30 ( 0.30)	0.99	8242.2	12300.00
3	7624.15	75.60	1.110	0.30 ( 0.30)	0.98	8530.2	12330.00
4	7790.13	78.31	1.092	0.30 ( 0.30)	0.98	9042.3	12410.00
5	7994.80	82.55	1.063	0.30 ( 0.29)	0.98	9772.8	12400.00
6	8150.71	87.34	1.030	0.30 ( 0.29)	0.98	10463.0	12211.00
7	8243.64	91.55	1.005	0.30 ( 0.29)	0.98	11058.8	12201.00
8	8206.30	95.76	0.987	0.30 ( 0.29)	0.98	11533.3	12111.00
9	8181.35	98.39	0.976	0.30 ( 0.29)	0.98	11845.0	12231.00
10	8146.02	101.20	0.964	0.30 ( 0.29)	0.98	12144.9	12101.10
11	8126.24	102.17	0.959	0.30 ( 0.29)	0.98	12236.5	12261.00
12	7677.07	113.44	0.911	0.30 ( 0.29)	0.98	12992.1	12010.00
13	7237.60	121.90	0.878	0.30 ( 0.29)	0.98	13116.2	12000.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 8243.64 Tc (MIN.) = 91.55  
 AREA-AVERAGED Fm (INCH/HR) = 0.29 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA (ACRES) = 11058.80

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 380.28 DOWNSTREAM (FEET) = 347.47  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 3113.51 CHANNEL SLOPE = 0.0105  
 GIVEN CHANNEL BASE (FEET) = 100.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 7.54  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 0.979

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	120.94	0.30	0.974	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.974

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8281.01

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.44

AVERAGE FLOW DEPTH(FEET) = 7.53 TRAVEL TIME(MIN.) = 6.14

Tc(MIN.) = 97.69

SUBAREA AREA(ACRES) = 120.94 SUBAREA RUNOFF(CFS) = 74.75

EFFECTIVE AREA(ACRES) = 11179.74 AREA-AVERAGED Fm(INCH/HR) = 0.29

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98

TOTAL AREA(ACRES) = 13237.1 PEAK FLOW RATE(CFS) = 8243.64

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.52

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 7.52 FLOW VELOCITY(FEET/SEC.) = 8.43

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12527.00 = 77156.98 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6814.50	66.89	1.169	0.30( 0.30)	0.99	6391.3	12500.00
2	7516.29	80.52	1.077	0.30( 0.30)	0.99	8363.2	12300.00
3	7624.15	81.90	1.067	0.30( 0.30)	0.98	8651.1	12330.00
4	7790.13	84.56	1.049	0.30( 0.30)	0.98	9163.3	12410.00
5	7994.80	88.76	1.021	0.30( 0.29)	0.98	9893.7	12400.00
6	8150.71	93.51	0.997	0.30( 0.29)	0.98	10583.9	12211.00
7	8243.64	97.69	0.979	0.30( 0.29)	0.98	11179.7	12201.00
8	8206.30	101.91	0.961	0.30( 0.29)	0.98	11654.2	12111.00
9	8181.35	104.55	0.949	0.30( 0.29)	0.98	11966.0	12231.00
10	8146.02	107.37	0.937	0.30( 0.29)	0.98	12265.8	12101.10
11	8126.24	108.35	0.933	0.30( 0.29)	0.98	12357.5	12261.00
12	7677.07	119.73	0.883	0.30( 0.29)	0.98	13113.0	12010.00
13	7237.60	128.31	0.865	0.30( 0.29)	0.98	13237.1	12000.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 8243.64 Tc(MIN.) = 97.69

AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 11179.74

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 13237.1 TC(MIN.) = 97.69

EFFECTIVE AREA(ACRES) = 11179.74 AREA-AVERAGED Fm(INCH/HR) = 0.29

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.980

PEAK FLOW RATE(CFS) = 8243.64

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6814.50	66.89	1.169	0.30( 0.30)	0.99	6391.3	12500.00
2	7516.29	80.52	1.077	0.30( 0.30)	0.99	8363.2	12300.00
3	7624.15	81.90	1.067	0.30( 0.30)	0.98	8651.1	12330.00
4	7790.13	84.56	1.049	0.30( 0.30)	0.98	9163.3	12410.00
5	7994.80	88.76	1.021	0.30( 0.29)	0.98	9893.7	12400.00

6	8150.71	93.51	0.997	0.30( 0.29)	0.98	10583.9	12211.00
7	8243.64	97.69	0.979	0.30( 0.29)	0.98	11179.7	12201.00
8	8206.30	101.91	0.961	0.30( 0.29)	0.98	11654.2	12111.00
9	8181.35	104.55	0.949	0.30( 0.29)	0.98	11966.0	12231.00
10	8146.02	107.37	0.937	0.30( 0.29)	0.98	12265.8	12101.10
11	8126.24	108.35	0.933	0.30( 0.29)	0.98	12357.5	12261.00
12	7677.07	119.73	0.883	0.30( 0.29)	0.98	13113.0	12010.00
13	7237.60	128.31	0.865	0.30( 0.29)	0.98	13237.1	12000.00

=====  
END OF RATIONAL METHOD ANALYSIS  
=====

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

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FILE NAME: S26.DAT  
TIME/DATE OF STUDY: 09:44 09/12/2017  
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--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.513
- 2) 10.00; 3.519
- 3) 15.00; 2.687
- 4) 20.00; 2.242
- 5) 25.00; 1.935
- 6) 30.00; 1.741
- 7) 40.00; 1.473
- 8) 50.00; 1.311
- 9) 60.00; 1.211
- 10) 90.00; 1.007
- 11) 120.00; 0.877
- 12) 180.00; 0.757
- 13) 360.00; 0.563
- 14) 1200.00; 0.248

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO STREET-CROSSFALL (FT)	IN- / OUT-/PARK- SIDE / SIDE/ WAY	HEIGHT (FT)	GUTTER GEOMETRIES: CURB WIDTH (FT)	GUTTER GEOMETRIES: GUTTER LIP (FT)	GUTTER GEOMETRIES: HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

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FLOW PROCESS FROM NODE 11929.00 TO NODE 11929.00 IS CODE = 15.1

-----  
>>>>DEFINE MEMORY BANK # 1 <<<<<<  
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PEAK FLOWRATE TABLE FILE NAME: S19.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21915.10	16.86	0.30 ( 0.30)	0.99	5989.8	40200.00
2	25697.26	31.22	0.30 ( 0.30)	0.99	11187.2	40100.00
3	27506.13	40.84	0.30 ( 0.30)	0.99	14499.0	11801.00
4	29742.04	52.15	0.30 ( 0.30)	0.99	19078.8	11530.00
5	30871.96	56.78	0.30 ( 0.30)	0.99	21396.8	11701.00
6	31813.21	60.43	0.30 ( 0.30)	0.99	23465.7	11910.00
7	34630.52	71.18	0.30 ( 0.30)	0.99	30185.2	10800.00
8	35384.44	75.55	0.30 ( 0.30)	0.99	33128.0	11130.00
9	35549.02	85.15	0.30 ( 0.30)	0.99	38166.7	12410.00
10	35469.49	88.03	0.30 ( 0.30)	0.99	39548.1	10600.00
11	35364.94	93.38	0.30 ( 0.30)	0.99	41908.8	11201.00
12	35132.55	98.29	0.30 ( 0.30)	0.99	43638.6	12201.00
13	34868.52	101.00	0.30 ( 0.30)	0.99	44429.0	10410.00
14	34337.37	105.14	0.30 ( 0.30)	0.99	45493.9	12231.00
15	33972.47	107.97	0.30 ( 0.30)	0.99	46170.2	12101.10
16	33257.06	112.69	0.30 ( 0.30)	0.99	47130.3	10400.00
17	32108.15	120.34	0.30 ( 0.30)	0.99	48424.9	12010.00
18	31078.39	126.05	0.30 ( 0.30)	0.99	48773.5	10210.00
19	30642.96	128.93	0.30 ( 0.30)	0.99	48889.0	12000.00
20	27598.74	153.21	0.30 ( 0.30)	0.99	49511.8	10100.00
TOTAL AREA (ACRES) =						49511.8

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FLOW PROCESS FROM NODE 11929.00 TO NODE 11929.00 IS CODE = 14.0

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>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
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MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21915.10	16.86	0.30 ( 0.30)	0.99	5989.8	40200.00
2	25697.26	31.22	0.30 ( 0.30)	0.99	11187.2	40100.00
3	27506.13	40.84	0.30 ( 0.30)	0.99	14499.0	11801.00
4	29742.04	52.15	0.30 ( 0.30)	0.99	19078.8	11530.00
5	30871.96	56.78	0.30 ( 0.30)	0.99	21396.8	11701.00
6	31813.21	60.43	0.30 ( 0.30)	0.99	23465.7	11910.00
7	34630.52	71.18	0.30 ( 0.30)	0.99	30185.2	10800.00
8	35384.44	75.55	0.30 ( 0.30)	0.99	33128.0	11130.00
9	35549.02	85.15	0.30 ( 0.30)	0.99	38166.7	12410.00
10	35469.49	88.03	0.30 ( 0.30)	0.99	39548.1	10600.00
11	35364.94	93.38	0.30 ( 0.30)	0.99	41908.8	11201.00
12	35132.55	98.29	0.30 ( 0.30)	0.99	43638.6	12201.00
13	34868.52	101.00	0.30 ( 0.30)	0.99	44429.0	10410.00
14	34337.37	105.14	0.30 ( 0.30)	0.99	45493.9	12231.00
15	33972.47	107.97	0.30 ( 0.30)	0.99	46170.2	12101.10
16	33257.06	112.69	0.30 ( 0.30)	0.99	47130.3	10400.00
17	32108.15	120.34	0.30 ( 0.30)	0.99	48424.9	12010.00
18	31078.39	126.05	0.30 ( 0.30)	0.99	48773.5	10210.00

19 30642.96 128.93 0.30( 0.30) 0.99 48889.0 12000.00  
 20 27598.74 153.21 0.30( 0.30) 0.99 49511.8 10100.00  
 TOTAL AREA (ACRES) = 49511.8

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FLOW PROCESS FROM NODE 11929.00 TO NODE 12601.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 341.63 DOWNSTREAM(FEET) = 325.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1467.93 CHANNEL SLOPE = 0.0113  
 GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 7.89  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.031

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 14.11 0.30 0.992 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.992  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 35553.67  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 18.81  
 AVERAGE FLOW DEPTH(FEET) = 7.89 TRAVEL TIME(MIN.) = 1.30  
 Tc(MIN.) = 86.45

SUBAREA AREA(ACRES) = 14.11 SUBAREA RUNOFF(CFS) = 9.32  
 EFFECTIVE AREA(ACRES) = 38180.84 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 49525.9 PEAK FLOW RATE(CFS) = 35549.02  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 7.89

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 7.89 FLOW VELOCITY(FEET/SEC.) = 18.81  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12601.00 = 99868.45 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12601.00 TO NODE 12601.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610318X.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	218.36	16.78	0.30( 0.30)	1.00	108.9	31800.00
2	206.21	20.27	0.30( 0.30)	1.00	119.0	31810.00
TOTAL AREA(ACRES) = 119.0						

\*\*\*\*\*

FLOW PROCESS FROM NODE 12601.00 TO NODE 12601.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21915.10	18.39	2.385	0.30( 0.30)	0.99	6003.9	40200.00
2	25697.26	32.67	1.669	0.30( 0.30)	0.99	11201.3	40100.00
3	27506.13	42.26	1.436	0.30( 0.30)	0.99	14513.1	11801.00
4	29742.04	53.54	1.276	0.30( 0.30)	0.99	19092.9	11530.00
5	30871.96	58.14	1.230	0.30( 0.30)	0.99	21410.9	11701.00
6	31813.21	61.78	1.199	0.30( 0.30)	0.99	23479.9	11910.00
7	34630.52	72.49	1.126	0.30( 0.30)	0.99	30199.4	10800.00
8	35384.44	76.86	1.096	0.30( 0.30)	0.99	33142.1	11130.00
9	35549.02	86.45	1.031	0.30( 0.30)	0.99	38180.8	12410.00
10	35469.49	89.33	1.012	0.30( 0.30)	0.99	39562.3	10600.00
11	35364.94	94.69	0.987	0.30( 0.30)	0.99	41923.0	11201.00
12	35132.55	99.59	0.965	0.30( 0.30)	0.99	43652.7	12201.00
13	34868.52	102.31	0.954	0.30( 0.30)	0.99	44443.2	10410.00
14	34337.37	106.46	0.936	0.30( 0.30)	0.99	45508.0	12231.00
15	33972.47	109.29	0.923	0.30( 0.30)	0.99	46184.3	12101.10
16	33257.06	114.02	0.903	0.30( 0.30)	0.99	47144.4	10400.00
17	32108.15	121.69	0.874	0.30( 0.30)	0.99	48439.0	12010.00
18	31078.39	127.41	0.862	0.30( 0.30)	0.99	48787.7	10210.00
19	30642.96	130.29	0.856	0.30( 0.30)	0.99	48903.1	12000.00
20	27598.74	154.62	0.808	0.30( 0.30)	0.99	49525.9	10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12601.00 =							99868.45 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	218.36	16.78	2.529	0.30( 0.30)	1.00	108.9	31800.00
2	206.21	20.27	2.225	0.30( 0.30)	1.00	119.0	31810.00
LONGEST FLOWPATH FROM NODE 31810.00 TO NODE 12601.00 =							4599.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21586.81	16.78	2.529	0.30( 0.30)	0.99	5586.6	31800.00
2	22127.85	18.39	2.385	0.30( 0.30)	0.99	6117.5	40200.00
3	22618.88	20.27	2.225	0.30( 0.30)	0.99	6806.7	31810.00
4	25843.91	32.67	1.669	0.30( 0.30)	0.99	11320.4	40100.00
5	27627.84	42.26	1.436	0.30( 0.30)	0.99	14632.2	11801.00
6	29846.53	53.54	1.276	0.30( 0.30)	0.99	19211.9	11530.00
7	30971.52	58.14	1.230	0.30( 0.30)	0.99	21529.9	11701.00
8	31909.48	61.78	1.199	0.30( 0.30)	0.99	23598.9	11910.00
9	34718.98	72.49	1.126	0.30( 0.30)	0.99	30318.4	10800.00
10	35469.73	76.86	1.096	0.30( 0.30)	0.99	33261.1	11130.00
11	35627.32	86.45	1.031	0.30( 0.30)	0.99	38299.9	12410.00
12	35545.70	89.33	1.012	0.30( 0.30)	0.99	39681.3	10600.00
13	35438.49	94.69	0.987	0.30( 0.30)	0.99	42042.0	11201.00
14	35203.82	99.59	0.965	0.30( 0.30)	0.99	43771.7	12201.00
15	34938.52	102.31	0.954	0.30( 0.30)	0.99	44562.2	10410.00
16	34405.45	106.46	0.936	0.30( 0.30)	0.99	45627.1	12231.00
17	34039.24	109.29	0.923	0.30( 0.30)	0.99	46303.3	12101.10
18	33321.63	114.02	0.903	0.30( 0.30)	0.99	47263.5	10400.00
19	32169.59	121.69	0.874	0.30( 0.30)	0.99	48558.0	12010.00
20	31138.60	127.41	0.862	0.30( 0.30)	0.99	48906.7	10210.00
21	30702.56	130.29	0.856	0.30( 0.30)	0.99	49022.2	12000.00
22	27653.12	154.62	0.808	0.30( 0.30)	0.99	49644.9	10100.00
TOTAL AREA(ACRES) =							49644.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 35627.32 Tc(MIN.) = 86.454  
 EFFECTIVE AREA(ACRES) = 38299.86 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 49644.9  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12601.00 = 99868.45 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12601.00 TO NODE 12602.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 325.00 DOWNSTREAM(FEET) = 313.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1377.46 CHANNEL SLOPE = 0.0087  
 GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 8.52  
 CHANNEL FLOW THRU SUBAREA(CFS) = 35627.32  
 FLOW VELOCITY(FEET/SEC.) = 17.24 FLOW DEPTH(FEET) = 8.52  
 TRAVEL TIME(MIN.) = 1.33 Tc(MIN.) = 87.79  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12602.00 = 101245.91 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12602.00 TO NODE 12603.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 313.00 DOWNSTREAM(FEET) = 310.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 312.40 CHANNEL SLOPE = 0.0096  
 GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 8.28  
 CHANNEL FLOW THRU SUBAREA(CFS) = 35627.32  
 FLOW VELOCITY(FEET/SEC.) = 17.82 FLOW DEPTH(FEET) = 8.28  
 TRAVEL TIME(MIN.) = 0.29 Tc(MIN.) = 88.08  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12602.00 TO NODE 12603.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12603.00 TO NODE 12603.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610317X.DNA  
 MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	127.68	16.60	0.30( 0.30)	1.00	63.2	31700.00
2	124.08	20.12	0.30( 0.30)	1.00	71.3	31710.00
TOTAL AREA(ACRES) =						71.3

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12603.00 TO NODE 12603.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21586.81	18.70	2.358	0.30( 0.30)	0.99	5586.6	31800.00
2	22127.85	20.30	2.224	0.30( 0.30)	0.99	6117.5	40200.00
3	22618.88	22.16	2.109	0.30( 0.30)	0.99	6806.7	31810.00
4	25843.91	34.48	1.621	0.30( 0.30)	0.99	11320.4	40100.00
5	27627.84	44.02	1.408	0.30( 0.30)	0.99	14632.2	11801.00
6	29846.53	55.26	1.258	0.30( 0.30)	0.99	19211.9	11530.00
7	30971.52	59.84	1.213	0.30( 0.30)	0.99	21529.9	11701.00
8	31909.48	63.46	1.187	0.30( 0.30)	0.99	23598.9	11910.00
9	34718.98	74.13	1.115	0.30( 0.30)	0.99	30318.4	10800.00
10	35469.73	78.48	1.085	0.30( 0.30)	0.99	33261.1	11130.00
11	35627.32	88.08	1.020	0.30( 0.30)	0.99	38299.9	12410.00
12	35545.70	90.96	1.003	0.30( 0.30)	0.99	39681.3	10600.00
13	35438.49	96.31	0.980	0.30( 0.30)	0.99	42042.0	11201.00
14	35203.82	101.22	0.958	0.30( 0.30)	0.99	43771.7	12201.00
15	34938.52	103.94	0.947	0.30( 0.30)	0.99	44562.2	10410.00
16	34405.45	108.10	0.929	0.30( 0.30)	0.99	45627.1	12231.00
17	34039.24	110.94	0.916	0.30( 0.30)	0.99	46303.3	12101.10
18	33321.63	115.68	0.896	0.30( 0.30)	0.99	47263.5	10400.00
19	32169.59	123.37	0.870	0.30( 0.30)	0.99	48558.0	12010.00
20	31138.60	129.10	0.859	0.30( 0.30)	0.99	48906.7	10210.00
21	30702.56	132.00	0.853	0.30( 0.30)	0.99	49022.2	12000.00
22	27653.12	156.39	0.804	0.30( 0.30)	0.99	49644.9	10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 =						101558.30 FEET.	

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	127.68	16.60	2.544	0.30( 0.30)	1.00	63.2	31700.00
2	124.08	20.12	2.235	0.30( 0.30)	1.00	71.3	31710.00
LONGEST FLOWPATH FROM NODE 31710.00 TO NODE 12603.00 =						3633.00 FEET.	

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21030.82	16.60	2.544	0.30( 0.30)	0.99	5023.6	31700.00
2	21712.34	18.70	2.358	0.30( 0.30)	0.99	5654.6	31800.00
3	22190.98	20.12	2.235	0.30( 0.30)	0.99	6128.9	31710.00
4	22251.22	20.30	2.224	0.30( 0.30)	0.99	6188.7	40200.00
5	22734.91	22.16	2.109	0.30( 0.30)	0.99	6877.9	31810.00
6	25928.62	34.48	1.621	0.30( 0.30)	0.99	11391.6	40100.00
7	27698.89	44.02	1.408	0.30( 0.30)	0.99	14703.4	11801.00
8	29907.99	55.26	1.258	0.30( 0.30)	0.99	19283.2	11530.00
9	31030.05	59.84	1.213	0.30( 0.30)	0.99	21601.2	11701.00
10	31966.40	63.46	1.187	0.30( 0.30)	0.99	23670.1	11910.00
11	34771.25	74.13	1.115	0.30( 0.30)	0.99	30389.7	10800.00
12	35520.09	78.48	1.085	0.30( 0.30)	0.99	33332.4	11130.00
13	35673.50	88.08	1.020	0.30( 0.30)	0.99	38371.1	12410.00
14	35590.77	90.96	1.003	0.30( 0.30)	0.99	39752.6	10600.00

15	35482.07	96.31	0.980	0.30	( 0.30)	0.99	42113.2	11201.00
16	35246.05	101.22	0.958	0.30	( 0.30)	0.99	43843.0	12201.00
17	34979.99	103.94	0.947	0.30	( 0.30)	0.99	44633.5	10410.00
18	34445.76	108.10	0.929	0.30	( 0.30)	0.99	45698.3	12231.00
19	34078.76	110.94	0.916	0.30	( 0.30)	0.99	46374.6	12101.10
20	33359.84	115.68	0.896	0.30	( 0.30)	0.99	47334.7	10400.00
21	32206.16	123.37	0.870	0.30	( 0.30)	0.99	48629.3	12010.00
22	31174.44	129.10	0.859	0.30	( 0.30)	0.99	48978.0	10210.00
23	30738.03	132.00	0.853	0.30	( 0.30)	0.99	49093.4	12000.00
24	27685.46	156.39	0.804	0.30	( 0.30)	0.99	49716.2	10100.00

TOTAL AREA (ACRES) = 49716.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 35673.50 Tc (MIN.) = 88.078  
EFFECTIVE AREA (ACRES) = 38371.13 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 49716.2  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12603.00 TO NODE 12603.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12603.00 TO NODE 12603.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610403X.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	322.28	18.95	0.30 ( 0.29)	0.97	175.0	40300.00

TOTAL AREA (ACRES) = 175.0

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12603.00 TO NODE 12603.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21030.82	16.60	2.544	0.30 ( 0.30)	0.99	5023.6	31700.00
2	21712.34	18.70	2.358	0.30 ( 0.30)	0.99	5654.6	31800.00
3	22190.98	20.12	2.235	0.30 ( 0.30)	0.99	6128.9	31710.00
4	22251.22	20.30	2.224	0.30 ( 0.30)	0.99	6188.7	40200.00
5	22734.91	22.16	2.109	0.30 ( 0.30)	0.99	6877.9	31810.00
6	25928.62	34.48	1.621	0.30 ( 0.30)	0.99	11391.6	40100.00
7	27698.89	44.02	1.408	0.30 ( 0.30)	0.99	14703.4	11801.00
8	29907.99	55.26	1.258	0.30 ( 0.30)	0.99	19283.2	11530.00
9	31030.05	59.84	1.213	0.30 ( 0.30)	0.99	21601.2	11701.00
10	31966.40	63.46	1.187	0.30 ( 0.30)	0.99	23670.1	11910.00
11	34771.25	74.13	1.115	0.30 ( 0.30)	0.99	30389.7	10800.00
12	35520.09	78.48	1.085	0.30 ( 0.30)	0.99	33332.4	11130.00

13	35673.50	88.08	1.020	0.30	( 0.30)	0.99	38371.1	12410.00
14	35590.77	90.96	1.003	0.30	( 0.30)	0.99	39752.6	10600.00
15	35482.07	96.31	0.980	0.30	( 0.30)	0.99	42113.2	11201.00
16	35246.05	101.22	0.958	0.30	( 0.30)	0.99	43843.0	12201.00
17	34979.99	103.94	0.947	0.30	( 0.30)	0.99	44633.5	10410.00
18	34445.76	108.10	0.929	0.30	( 0.30)	0.99	45698.3	12231.00
19	34078.76	110.94	0.916	0.30	( 0.30)	0.99	46374.6	12101.10
20	33359.84	115.68	0.896	0.30	( 0.30)	0.99	47334.7	10400.00
21	32206.16	123.37	0.870	0.30	( 0.30)	0.99	48629.3	12010.00
22	31174.44	129.10	0.859	0.30	( 0.30)	0.99	48978.0	10210.00
23	30738.03	132.00	0.853	0.30	( 0.30)	0.99	49093.4	12000.00
24	27685.46	156.39	0.804	0.30	( 0.30)	0.99	49716.2	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	322.28	18.95	2.336	0.30 ( 0.29)	0.97	175.0	40300.00

LONGEST FLOWPATH FROM NODE 40300.00 TO NODE 12603.00 = 5256.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21342.02	16.60	2.544	0.30 ( 0.30)	0.99	5177.0	31700.00
2	22033.83	18.70	2.358	0.30 ( 0.30)	0.99	5827.4	31800.00
3	22118.15	18.95	2.336	0.30 ( 0.30)	0.99	5912.5	40300.00
4	22497.38	20.12	2.235	0.30 ( 0.30)	0.99	6304.0	31710.00
5	22555.89	20.30	2.224	0.30 ( 0.30)	0.99	6363.8	40200.00
6	23021.54	22.16	2.109	0.30 ( 0.30)	0.99	7053.0	31810.00
7	26138.33	34.48	1.621	0.30 ( 0.30)	0.99	11566.7	40100.00
8	27875.03	44.02	1.408	0.30 ( 0.30)	0.99	14878.5	11801.00
9	30060.60	55.26	1.258	0.30 ( 0.30)	0.99	19458.3	11530.00
10	31175.44	59.84	1.213	0.30 ( 0.30)	0.99	21776.2	11701.00
11	32107.83	63.46	1.187	0.30 ( 0.30)	0.99	23845.2	11910.00
12	34901.25	74.13	1.115	0.30 ( 0.30)	0.99	30564.7	10800.00
13	35645.44	78.48	1.085	0.30 ( 0.30)	0.99	33507.4	11130.00
14	35788.57	88.08	1.020	0.30 ( 0.30)	0.99	38546.2	12410.00
15	35703.13	90.96	1.003	0.30 ( 0.30)	0.99	39927.6	10600.00
16	35590.78	96.31	0.980	0.30 ( 0.30)	0.99	42288.3	11201.00
17	35351.40	101.22	0.958	0.30 ( 0.30)	0.99	44018.0	12201.00
18	35083.49	103.94	0.947	0.30 ( 0.30)	0.99	44808.5	10410.00
19	34546.42	108.10	0.929	0.30 ( 0.30)	0.99	45873.4	12231.00
20	34177.48	110.94	0.916	0.30 ( 0.30)	0.99	46549.6	12101.10
21	33455.32	115.68	0.896	0.30 ( 0.30)	0.99	47509.8	10400.00
22	32297.64	123.37	0.870	0.30 ( 0.30)	0.99	48804.3	12010.00
23	31264.11	129.10	0.859	0.30 ( 0.30)	0.99	49153.0	10210.00
24	30826.78	132.00	0.853	0.30 ( 0.30)	0.99	49268.5	12000.00
25	27766.53	156.39	0.804	0.30 ( 0.30)	0.99	49891.2	10100.00

TOTAL AREA (ACRES) = 49891.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 35788.57 Tc (MIN.) = 88.078  
EFFECTIVE AREA (ACRES) = 38546.18 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 49891.2  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12603.00 TO NODE 12604.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 310.00 DOWNSTREAM(FEET) = 307.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 459.69 CHANNEL SLOPE = 0.0065
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
\*ESTIMATED CHANNEL HEIGHT(FEET) = 9.27
CHANNEL FLOW THRU SUBAREA(CFS) = 35788.57
FLOW VELOCITY(FEET/SEC.) = 15.68 FLOW DEPTH(FEET) = 9.27
TRAVEL TIME(MIN.) = 0.49 Tc(MIN.) = 88.57
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12604.00 = 102017.99 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12603.00 TO NODE 12604.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<<

\*\*\*\*\*

FLOW PROCESS FROM NODE 12604.00 TO NODE 12605.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 307.00 DOWNSTREAM(FEET) = 305.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 427.54 CHANNEL SLOPE = 0.0047
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.18
CHANNEL FLOW THRU SUBAREA(CFS) = 35788.57
FLOW VELOCITY(FEET/SEC.) = 14.01 FLOW DEPTH(FEET) = 10.18
TRAVEL TIME(MIN.) = 0.51 Tc(MIN.) = 89.08
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.00 = 102445.53 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12604.00 TO NODE 12605.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*MEMORY BANK # 3 IS EMPTY - PROCESS IGNORED.\*\*\*

\*\*\*\*\*

FLOW PROCESS FROM NODE 12605.00 TO NODE 12605.30 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 305.00 DOWNSTREAM(FEET) = 302.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 217.28 CHANNEL SLOPE = 0.0138
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.49
CHANNEL FLOW THRU SUBAREA(CFS) = 35788.57
FLOW VELOCITY(FEET/SEC.) = 20.13 FLOW DEPTH(FEET) = 7.49
TRAVEL TIME(MIN.) = 0.18 Tc(MIN.) = 89.26

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.30 = 102662.81 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12605.30 TO NODE 12605.30 IS CODE = 12

>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*MEMORY BANK # 3 IS EMPTY - PROCESS IGNORED.\*\*\*

\*\*\*\*\*

FLOW PROCESS FROM NODE 12605.30 TO NODE 12605.30 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610404X.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

Table with 7 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Fp (Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 5 rows of data and a total area calculation.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12605.30 TO NODE 12605.30 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

Table with 7 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp (Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 24 rows of data.



25 27766.53 157.67 0.802 0.30( 0.30) 0.99 49891.2 10100.00  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.30 = 102662.81 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	762.60	17.82	2.436	0.30( 0.30)	0.99	396.2	40430.00
2	753.57	18.38	2.387	0.30( 0.30)	0.99	400.8	40440.00
3	731.89	19.53	2.284	0.30( 0.30)	0.99	409.4	40400.00
4	727.71	19.70	2.269	0.30( 0.30)	0.99	410.2	40420.00
5	726.10	19.76	2.263	0.30( 0.30)	0.99	410.5	40410.00

LONGEST FLOWPATH FROM NODE 40400.00 TO NODE 12605.30 = 7428.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22048.36	17.82	2.436	0.30( 0.30)	0.99	5519.1	40430.00
2	22101.59	18.00	2.420	0.30( 0.30)	0.99	5574.7	31700.00
3	22219.31	18.38	2.387	0.30( 0.30)	0.99	5694.1	40440.00
4	22579.79	19.53	2.284	0.30( 0.30)	0.99	6062.0	40400.00
5	22633.42	19.70	2.269	0.30( 0.30)	0.99	6117.2	40420.00
6	22651.91	19.76	2.263	0.30( 0.30)	0.99	6136.3	40410.00
7	22750.12	20.08	2.237	0.30( 0.30)	0.99	6237.9	31800.00
8	22828.87	20.33	2.222	0.30( 0.30)	0.99	6322.9	40300.00
9	23181.79	21.49	2.150	0.30( 0.30)	0.99	6714.4	31710.00
10	23236.24	21.67	2.139	0.30( 0.30)	0.99	6774.2	40200.00
11	23659.84	23.52	2.026	0.30( 0.30)	0.99	7463.5	31810.00
12	26614.24	35.79	1.586	0.30( 0.30)	0.99	11977.1	40100.00
13	28277.52	45.30	1.387	0.30( 0.30)	0.99	15288.9	11801.00
14	30410.95	56.51	1.246	0.30( 0.30)	0.99	19868.7	11530.00
15	31510.19	61.07	1.204	0.30( 0.30)	0.99	22186.7	11701.00
16	32433.53	64.68	1.179	0.30( 0.30)	0.99	24255.7	11910.00
17	35200.23	75.32	1.107	0.30( 0.30)	0.99	30975.2	10800.00
18	35933.51	79.66	1.077	0.30( 0.30)	0.99	33917.9	11130.00
19	36052.55	89.26	1.012	0.30( 0.30)	0.99	38956.6	12410.00
20	35961.82	92.13	0.998	0.30( 0.30)	0.99	40338.1	10600.00
21	35840.89	97.49	0.975	0.30( 0.30)	0.99	42698.8	11201.00
22	35593.65	102.40	0.953	0.30( 0.30)	0.99	44428.5	12201.00
23	35321.38	105.13	0.941	0.30( 0.30)	0.99	45219.0	10410.00
24	34777.65	109.29	0.923	0.30( 0.30)	0.99	46283.8	12231.00
25	34404.16	112.14	0.911	0.30( 0.30)	0.99	46960.1	12101.10
26	33674.40	116.89	0.890	0.30( 0.30)	0.99	47920.2	10400.00
27	32508.35	124.58	0.868	0.30( 0.30)	0.99	49214.8	12010.00
28	31470.56	130.34	0.856	0.30( 0.30)	0.99	49563.5	10210.00
29	31031.10	133.24	0.851	0.30( 0.30)	0.99	49679.0	12000.00
30	27952.80	157.67	0.802	0.30( 0.30)	0.99	50301.7	10100.00

TOTAL AREA(ACRES) = 50301.7

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 36052.55 Tc(MIN.) = 89.255  
EFFECTIVE AREA(ACRES) = 38956.64 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 50301.7  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.30 = 102662.81 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12605.30 TO NODE 12605.60 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 302.00 DOWNSTREAM(FEET) = 295.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 738.76 CHANNEL SLOPE = 0.0095  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.37  
CHANNEL FLOW THRU SUBAREA(CFS) = 36052.55  
FLOW VELOCITY(FEET/SEC.) = 17.80 FLOW DEPTH(FEET) = 8.37  
TRAVEL TIME(MIN.) = 0.69 Tc(MIN.) = 89.95  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.60 = 103401.57 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12605.60 TO NODE 12605.60 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12605.60 TO NODE 12605.60 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610405X.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	178.01	13.93	0.30( 0.30)	1.00	77.1	40510.00
2	172.23	15.40	0.30( 0.30)	1.00	81.4	40500.00

TOTAL AREA(ACRES) = 81.4

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12605.60 TO NODE 12605.60 IS CODE = 11  
-----

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22048.36	18.63	2.364	0.30( 0.30)	0.99	5519.1	40430.00
2	22101.59	18.82	2.347	0.30( 0.30)	0.99	5574.7	31700.00
3	22219.31	19.19	2.314	0.30( 0.30)	0.99	5694.1	40440.00
4	22579.79	20.34	2.221	0.30( 0.30)	0.99	6062.0	40400.00
5	22633.42	20.51	2.211	0.30( 0.30)	0.99	6117.2	40420.00
6	22651.91	20.57	2.207	0.30( 0.30)	0.99	6136.3	40410.00
7	22750.12	20.89	2.187	0.30( 0.30)	0.99	6237.9	31800.00
8	22828.87	21.14	2.172	0.30( 0.30)	0.99	6322.9	40300.00
9	23181.79	22.29	2.101	0.30( 0.30)	0.99	6714.4	31710.00
10	23236.24	22.47	2.090	0.30( 0.30)	0.99	6774.2	40200.00
11	23659.84	24.32	1.977	0.30( 0.30)	0.99	7463.5	31810.00
12	26614.24	36.55	1.565	0.30( 0.30)	0.99	11977.1	40100.00
13	28277.52	46.05	1.375	0.30( 0.30)	0.99	15288.9	11801.00
14	30410.95	57.24	1.239	0.30( 0.30)	0.99	19868.7	11530.00
15	31510.19	61.80	1.199	0.30( 0.30)	0.99	22186.7	11701.00
16	32433.53	65.40	1.174	0.30( 0.30)	0.99	24255.7	11910.00
17	35200.23	76.02	1.102	0.30( 0.30)	0.99	30975.2	10800.00

18	35933.51	80.36	1.073	0.30	( 0.30)	0.99	33917.9	11130.00
19	36052.55	89.95	1.007	0.30	( 0.30)	0.99	38956.6	12410.00
20	35961.82	92.83	0.995	0.30	( 0.30)	0.99	40338.1	10600.00
21	35840.89	98.19	0.972	0.30	( 0.30)	0.99	42698.8	11201.00
22	35593.65	103.10	0.950	0.30	( 0.30)	0.99	44428.5	12201.00
23	35321.38	105.83	0.938	0.30	( 0.30)	0.99	45219.0	10410.00
24	34777.65	109.99	0.920	0.30	( 0.30)	0.99	46283.8	12231.00
25	34404.16	112.84	0.908	0.30	( 0.30)	0.99	46960.1	12101.10
26	33674.40	117.59	0.887	0.30	( 0.30)	0.99	47920.2	10400.00
27	32508.35	125.30	0.866	0.30	( 0.30)	0.99	49214.8	12010.00
28	31470.56	131.06	0.855	0.30	( 0.30)	0.99	49563.5	10210.00
29	31031.10	133.96	0.849	0.30	( 0.30)	0.99	49679.0	12000.00
30	27952.80	158.42	0.800	0.30	( 0.30)	0.99	50301.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.60 = 103401.57 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	178.01	13.93	2.866	0.30 ( 0.30)	1.00	77.1	40510.00
2	172.23	15.40	2.651	0.30 ( 0.30)	1.00	81.4	40500.00

LONGEST FLOWPATH FROM NODE 40500.00 TO NODE 12605.60 = 4091.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20661.08	13.93	2.866	0.30 ( 0.30)	0.99	4202.1	40510.00
2	20933.76	15.40	2.651	0.30 ( 0.30)	0.99	4643.4	40500.00
3	22199.53	18.63	2.364	0.30 ( 0.30)	0.99	5600.5	40430.00
4	22251.55	18.82	2.347	0.30 ( 0.30)	0.99	5656.1	31700.00
5	22366.84	19.19	2.314	0.30 ( 0.30)	0.99	5775.5	40440.00
6	22720.54	20.34	2.221	0.30 ( 0.30)	0.99	6143.4	40400.00
7	22773.39	20.51	2.211	0.30 ( 0.30)	0.99	6198.6	40420.00
8	22791.61	20.57	2.207	0.30 ( 0.30)	0.99	6217.7	40410.00
9	22888.36	20.89	2.187	0.30 ( 0.30)	0.99	6319.2	31800.00
10	22966.02	21.14	2.172	0.30 ( 0.30)	0.99	6404.3	40300.00
11	23313.74	22.29	2.101	0.30 ( 0.30)	0.99	6795.8	31710.00
12	23367.38	22.47	2.090	0.30 ( 0.30)	0.99	6855.6	40200.00
13	23782.67	24.32	1.977	0.30 ( 0.30)	0.99	7544.8	31810.00
14	26706.96	36.55	1.565	0.30 ( 0.30)	0.99	12058.5	40100.00
15	28356.28	46.05	1.375	0.30 ( 0.30)	0.99	15370.3	11801.00
16	30479.73	57.24	1.239	0.30 ( 0.30)	0.99	19950.1	11530.00
17	31576.05	61.80	1.199	0.30 ( 0.30)	0.99	22268.0	11701.00
18	32497.60	65.40	1.174	0.30 ( 0.30)	0.99	24337.0	11910.00
19	35259.01	76.02	1.102	0.30 ( 0.30)	0.99	31056.5	10800.00
20	35990.13	80.36	1.073	0.30 ( 0.30)	0.99	33999.3	11130.00
21	36104.39	89.95	1.007	0.30 ( 0.30)	0.99	39038.0	12410.00
22	36012.75	92.83	0.995	0.30 ( 0.30)	0.99	40419.4	10600.00
23	35890.12	98.19	0.972	0.30 ( 0.30)	0.99	42780.1	11201.00
24	35641.32	103.10	0.950	0.30 ( 0.30)	0.99	44509.8	12201.00
25	35368.18	105.83	0.938	0.30 ( 0.30)	0.99	45300.3	10410.00
26	34823.12	109.99	0.920	0.30 ( 0.30)	0.99	46365.2	12231.00
27	34448.73	112.84	0.908	0.30 ( 0.30)	0.99	47041.5	12101.10
28	33717.47	117.59	0.887	0.30 ( 0.30)	0.99	48001.6	10400.00
29	32549.87	125.30	0.866	0.30 ( 0.30)	0.99	49296.2	12010.00
30	31511.25	131.06	0.855	0.30 ( 0.30)	0.99	49644.8	10210.00
31	31071.36	133.96	0.849	0.30 ( 0.30)	0.99	49760.3	12000.00
32	27989.48	158.42	0.800	0.30 ( 0.30)	0.99	50383.1	10100.00

TOTAL AREA (ACRES) = 50383.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 36104.39 Tc(MIN.) = 89.947  
 EFFECTIVE AREA(ACRES) = 39038.02 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 50383.1  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.60 = 103401.57 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12605.60 TO NODE 12606.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 295.00 DOWNSTREAM(FEET) = 286.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1203.43 CHANNEL SLOPE = 0.0075  
 GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 8.96  
 CHANNEL FLOW THRU SUBAREA(CFS) = 36104.39  
 FLOW VELOCITY(FEET/SEC.) = 16.46 FLOW DEPTH(FEET) = 8.96  
 TRAVEL TIME(MIN.) = 1.22 Tc(MIN.) = 91.17  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12606.00 = 104605.00 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12606.00 TO NODE 12606.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12606.00 TO NODE 12606.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<

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PEAK FLOWRATE TABLE FILE NAME: 0610406X.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	232.91	20.42	0.30 ( 0.30)	0.99	135.0	40600.00

TOTAL AREA(ACRES) = 135.0

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12606.00 TO NODE 12606.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20661.08	15.40	2.652	0.30 ( 0.30)	0.99	4202.1	40510.00
2	20933.76	16.86	2.521	0.30 ( 0.30)	0.99	4643.4	40500.00
3	22199.53	20.07	2.238	0.30 ( 0.30)	0.99	5600.5	40430.00
4	22251.55	20.25	2.227	0.30 ( 0.30)	0.99	5656.1	31700.00
5	22366.84	20.62	2.204	0.30 ( 0.30)	0.99	5775.5	40440.00
6	22720.54	21.76	2.134	0.30 ( 0.30)	0.99	6143.4	40400.00
7	22773.39	21.93	2.123	0.30 ( 0.30)	0.99	6198.6	40420.00

8	22791.61	21.99	2.120	0.30 ( 0.30)	0.99	6217.7	40410.00
9	22888.36	22.31	2.100	0.30 ( 0.30)	0.99	6319.2	31800.00
10	22966.02	22.56	2.085	0.30 ( 0.30)	0.99	6404.3	40300.00
11	23313.74	23.70	2.015	0.30 ( 0.30)	0.99	6795.8	31710.00
12	23367.38	23.88	2.004	0.30 ( 0.30)	0.99	6855.6	40200.00
13	23782.67	25.72	1.907	0.30 ( 0.30)	0.99	7544.8	31810.00
14	26706.96	37.90	1.529	0.30 ( 0.30)	0.99	12058.5	40100.00
15	28356.28	47.37	1.354	0.30 ( 0.30)	0.99	15370.3	11801.00
16	30479.73	58.53	1.226	0.30 ( 0.30)	0.99	19950.1	11530.00
17	31576.05	63.07	1.190	0.30 ( 0.30)	0.99	22268.0	11701.00
18	32497.60	66.66	1.166	0.30 ( 0.30)	0.99	24337.0	11910.00
19	35259.01	77.24	1.094	0.30 ( 0.30)	0.99	31056.5	10800.00
20	35990.13	81.58	1.064	0.30 ( 0.30)	0.99	33999.3	11130.00
21	36104.39	91.17	1.002	0.30 ( 0.30)	0.99	39038.0	12410.00
22	36012.75	94.05	0.989	0.30 ( 0.30)	0.99	40419.4	10600.00
23	35890.12	99.41	0.966	0.30 ( 0.30)	0.99	42780.1	11201.00
24	35641.32	104.32	0.945	0.30 ( 0.30)	0.99	44509.8	12201.00
25	35368.18	107.05	0.933	0.30 ( 0.30)	0.99	45300.3	10410.00
26	34823.12	111.23	0.915	0.30 ( 0.30)	0.99	46365.2	12231.00
27	34448.73	114.07	0.903	0.30 ( 0.30)	0.99	47041.5	12101.10
28	33717.47	118.84	0.882	0.30 ( 0.30)	0.99	48001.6	10400.00
29	32549.87	126.56	0.864	0.30 ( 0.30)	0.99	49296.2	12010.00
30	31511.25	132.33	0.852	0.30 ( 0.30)	0.99	49644.8	10210.00
31	31071.36	135.25	0.847	0.30 ( 0.30)	0.99	49760.3	12000.00
32	27989.48	159.75	0.798	0.30 ( 0.30)	0.99	50383.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12606.00 = 104605.00 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	232.91	20.42	2.216	0.30 ( 0.30)	0.99	135.0	40600.00

LONGEST FLOWPATH FROM NODE 40600.00 TO NODE 12606.00 = 6107.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20876.57	15.40	2.652	0.30 ( 0.30)	0.99	4303.9	40510.00
2	21156.69	16.86	2.521	0.30 ( 0.30)	0.99	4754.9	40500.00
3	22431.00	20.07	2.238	0.30 ( 0.30)	0.99	5733.2	40430.00
4	22483.79	20.25	2.227	0.30 ( 0.30)	0.99	5789.9	31700.00
5	22536.65	20.42	2.216	0.30 ( 0.30)	0.99	5845.1	40600.00
6	22598.25	20.62	2.204	0.30 ( 0.30)	0.99	5910.5	40440.00
7	22943.46	21.76	2.134	0.30 ( 0.30)	0.99	6278.3	40400.00
8	22995.03	21.93	2.123	0.30 ( 0.30)	0.99	6333.5	40420.00
9	23012.80	21.99	2.120	0.30 ( 0.30)	0.99	6352.6	40410.00
10	23107.16	22.31	2.100	0.30 ( 0.30)	0.99	6454.2	31800.00
11	23183.00	22.56	2.085	0.30 ( 0.30)	0.99	6539.3	40300.00
12	23522.16	23.70	2.015	0.30 ( 0.30)	0.99	6930.8	31710.00
13	23574.47	23.88	2.004	0.30 ( 0.30)	0.99	6990.6	40200.00
14	23978.02	25.72	1.907	0.30 ( 0.30)	0.99	7679.8	31810.00
15	26856.44	37.90	1.529	0.30 ( 0.30)	0.99	12193.5	40100.00
16	28484.43	47.37	1.354	0.30 ( 0.30)	0.99	15505.3	11801.00
17	30592.35	58.53	1.226	0.30 ( 0.30)	0.99	20085.1	11530.00
18	31684.34	63.07	1.190	0.30 ( 0.30)	0.99	22403.0	11701.00
19	32602.93	66.66	1.166	0.30 ( 0.30)	0.99	24472.0	11910.00
20	35355.60	77.24	1.094	0.30 ( 0.30)	0.99	31191.5	10800.00
21	36083.14	81.58	1.064	0.30 ( 0.30)	0.99	34134.2	11130.00
22	36189.84	91.17	1.002	0.30 ( 0.30)	0.99	39173.0	12410.00

23	36096.68	94.05	0.989	0.30 ( 0.30)	0.99	40554.4	10600.00
24	35971.22	99.41	0.966	0.30 ( 0.30)	0.99	42915.1	11201.00
25	35719.84	104.32	0.945	0.30 ( 0.30)	0.99	44644.8	12201.00
26	35445.26	107.05	0.933	0.30 ( 0.30)	0.99	45435.3	10410.00
27	34898.01	111.23	0.915	0.30 ( 0.30)	0.99	46500.2	12231.00
28	34522.12	114.07	0.903	0.30 ( 0.30)	0.99	47176.4	12101.10
29	33788.35	118.84	0.882	0.30 ( 0.30)	0.99	48136.6	10400.00
30	32618.55	126.56	0.864	0.30 ( 0.30)	0.99	49431.1	12010.00
31	31578.52	132.33	0.852	0.30 ( 0.30)	0.99	49779.8	10210.00
32	31137.92	135.25	0.847	0.30 ( 0.30)	0.99	49895.3	12000.00
33	28050.09	159.75	0.798	0.30 ( 0.30)	0.99	50518.0	10100.00

TOTAL AREA (ACRES) = 50518.0

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 36189.84 Tc (MIN.) = 91.166  
EFFECTIVE AREA (ACRES) = 39172.99 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 50518.0  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12606.00 = 104605.00 FEET.

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 50518.0 TC (MIN.) = 91.17  
EFFECTIVE AREA (ACRES) = 39172.99 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.994  
PEAK FLOW RATE (CFS) = 36189.84

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20876.57	15.40	2.652	0.30 ( 0.30)	0.99	4303.9	40510.00
2	21156.69	16.86	2.521	0.30 ( 0.30)	0.99	4754.9	40500.00
3	22431.00	20.07	2.238	0.30 ( 0.30)	0.99	5733.2	40430.00
4	22483.79	20.25	2.227	0.30 ( 0.30)	0.99	5789.9	31700.00
5	22536.65	20.42	2.216	0.30 ( 0.30)	0.99	5845.1	40600.00
6	22598.25	20.62	2.204	0.30 ( 0.30)	0.99	5910.5	40440.00
7	22943.46	21.76	2.134	0.30 ( 0.30)	0.99	6278.3	40400.00
8	22995.03	21.93	2.123	0.30 ( 0.30)	0.99	6333.5	40420.00
9	23012.80	21.99	2.120	0.30 ( 0.30)	0.99	6352.6	40410.00
10	23107.16	22.31	2.100	0.30 ( 0.30)	0.99	6454.2	31800.00
11	23183.00	22.56	2.085	0.30 ( 0.30)	0.99	6539.3	40300.00
12	23522.16	23.70	2.015	0.30 ( 0.30)	0.99	6930.8	31710.00
13	23574.47	23.88	2.004	0.30 ( 0.30)	0.99	6990.6	40200.00
14	23978.02	25.72	1.907	0.30 ( 0.30)	0.99	7679.8	31810.00
15	26856.44	37.90	1.529	0.30 ( 0.30)	0.99	12193.5	40100.00
16	28484.43	47.37	1.354	0.30 ( 0.30)	0.99	15505.3	11801.00
17	30592.35	58.53	1.226	0.30 ( 0.30)	0.99	20085.1	11530.00
18	31684.34	63.07	1.190	0.30 ( 0.30)	0.99	22403.0	11701.00
19	32602.93	66.66	1.166	0.30 ( 0.30)	0.99	24472.0	11910.00
20	35355.60	77.24	1.094	0.30 ( 0.30)	0.99	31191.5	10800.00
21	36083.14	81.58	1.064	0.30 ( 0.30)	0.99	34134.2	11130.00
22	36189.84	91.17	1.002	0.30 ( 0.30)	0.99	39173.0	12410.00
23	36096.68	94.05	0.989	0.30 ( 0.30)	0.99	40554.4	10600.00
24	35971.22	99.41	0.966	0.30 ( 0.30)	0.99	42915.1	11201.00
25	35719.84	104.32	0.945	0.30 ( 0.30)	0.99	44644.8	12201.00
26	35445.26	107.05	0.933	0.30 ( 0.30)	0.99	45435.3	10410.00
27	34898.01	111.23	0.915	0.30 ( 0.30)	0.99	46500.2	12231.00
28	34522.12	114.07	0.903	0.30 ( 0.30)	0.99	47176.4	12101.10
29	33788.35	118.84	0.882	0.30 ( 0.30)	0.99	48136.6	10400.00

30	32618.55	126.56	0.864	0.30	( 0.30)	0.99	49431.1	12010.00
31	31578.52	132.33	0.852	0.30	( 0.30)	0.99	49779.8	10210.00
32	31137.92	135.25	0.847	0.30	( 0.30)	0.99	49895.3	12000.00
33	28050.09	159.75	0.798	0.30	( 0.30)	0.99	50518.0	10100.00

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=====  
END OF RATIONAL METHOD ANALYSIS

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

-----  
FILE NAME: S27.DAT  
TIME/DATE OF STUDY: 09:45 09/12/2017  
=====

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--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.460
- 2) 10.00; 3.494
- 3) 15.00; 2.672
- 4) 20.00; 2.231
- 5) 25.00; 1.927
- 6) 30.00; 1.734
- 7) 40.00; 1.467
- 8) 50.00; 1.306
- 9) 60.00; 1.203
- 10) 90.00; 1.000
- 11) 120.00; 0.870
- 12) 180.00; 0.748
- 13) 360.00; 0.556
- 14) 1200.00; 0.244

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO STREET-CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12606.00 TO NODE 12606.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: S26.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21156.69	16.86	0.30 ( 0.30)	0.99	4754.9	40500.00
2	22598.25	20.62	0.30 ( 0.30)	0.99	5910.5	40440.00
3	23978.02	25.72	0.30 ( 0.30)	0.99	7679.8	31810.00
4	26856.44	37.90	0.30 ( 0.30)	0.99	12193.5	40100.00
5	28484.43	47.37	0.30 ( 0.30)	0.99	15505.3	11801.00
6	30592.35	58.53	0.30 ( 0.30)	0.99	20085.1	11530.00
7	31684.34	63.07	0.30 ( 0.30)	0.99	22403.0	11701.00
8	32602.93	66.66	0.30 ( 0.30)	0.99	24472.0	11910.00
9	35355.60	77.24	0.30 ( 0.30)	0.99	31191.5	10800.00
10	36083.14	81.58	0.30 ( 0.30)	0.99	34134.2	11130.00
11	36189.84	91.17	0.30 ( 0.30)	0.99	39173.0	12410.00
12	35971.22	99.41	0.30 ( 0.30)	0.99	42915.1	11201.00
13	35719.84	104.32	0.30 ( 0.30)	0.99	44644.8	12201.00
14	34898.01	111.23	0.30 ( 0.30)	0.99	46500.2	12231.00
15	34522.12	114.07	0.30 ( 0.30)	0.99	47176.4	12101.10
16	33788.35	118.84	0.30 ( 0.30)	0.99	48136.6	10400.00
17	32618.55	126.56	0.30 ( 0.30)	0.99	49431.1	12010.00
18	31578.52	132.33	0.30 ( 0.30)	0.99	49779.8	10210.00
19	31137.92	135.25	0.30 ( 0.30)	0.99	49895.3	12000.00
20	28050.09	159.75	0.30 ( 0.30)	0.99	50518.0	10100.00
TOTAL AREA (ACRES) =						50518.0

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FLOW PROCESS FROM NODE 12606.00 TO NODE 12606.00 IS CODE = 14.0  
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>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21156.69	16.86	0.30 ( 0.30)	0.99	4754.9	40500.00
2	22598.25	20.62	0.30 ( 0.30)	0.99	5910.5	40440.00
3	23978.02	25.72	0.30 ( 0.30)	0.99	7679.8	31810.00
4	26856.44	37.90	0.30 ( 0.30)	0.99	12193.5	40100.00
5	28484.43	47.37	0.30 ( 0.30)	0.99	15505.3	11801.00
6	30592.35	58.53	0.30 ( 0.30)	0.99	20085.1	11530.00
7	31684.34	63.07	0.30 ( 0.30)	0.99	22403.0	11701.00
8	32602.93	66.66	0.30 ( 0.30)	0.99	24472.0	11910.00
9	35355.60	77.24	0.30 ( 0.30)	0.99	31191.5	10800.00
10	36083.14	81.58	0.30 ( 0.30)	0.99	34134.2	11130.00
11	36189.84	91.17	0.30 ( 0.30)	0.99	39173.0	12410.00
12	35971.22	99.41	0.30 ( 0.30)	0.99	42915.1	11201.00
13	35719.84	104.32	0.30 ( 0.30)	0.99	44644.8	12201.00
14	34898.01	111.23	0.30 ( 0.30)	0.99	46500.2	12231.00
15	34522.12	114.07	0.30 ( 0.30)	0.99	47176.4	12101.10
16	33788.35	118.84	0.30 ( 0.30)	0.99	48136.6	10400.00
17	32618.55	126.56	0.30 ( 0.30)	0.99	49431.1	12010.00
18	31578.52	132.33	0.30 ( 0.30)	0.99	49779.8	10210.00

19 31137.92 135.25 0.30( 0.30) 0.99 49895.3 12000.00  
20 28050.09 159.75 0.30( 0.30) 0.99 50518.0 10100.00  
TOTAL AREA (ACRES) = 50518.0

\*\*\*\*\*

FLOW PROCESS FROM NODE 12606.00 TO NODE 12701.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 286.00 DOWNSTREAM(FEET) = 276.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1260.19 CHANNEL SLOPE = 0.0079  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.82  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 0.990

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	7.55	0.30	0.889	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.889  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 36192.29  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.80  
AVERAGE FLOW DEPTH(FEET) = 8.82 TRAVEL TIME(MIN.) = 1.25  
Tc(MIN.) = 92.42  
SUBAREA AREA(ACRES) = 7.55 SUBAREA RUNOFF(CFS) = 4.91  
EFFECTIVE AREA(ACRES) = 39180.54 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 50525.6 PEAK FLOW RATE(CFS) = 36189.84  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.82

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 8.82 FLOW VELOCITY(FEET/SEC.) = 16.80  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12701.00 = 105865.19 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12701.00 TO NODE 12720.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 276.00 DOWNSTREAM(FEET) = 275.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 147.65 CHANNEL SLOPE = 0.0068  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 9.23  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 0.989

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	1.49	0.30	0.972	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.972  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 36190.30

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.93  
AVERAGE FLOW DEPTH(FEET) = 9.23 TRAVEL TIME(MIN.) = 0.15  
Tc(MIN.) = 92.57  
SUBAREA AREA(ACRES) = 1.49 SUBAREA RUNOFF(CFS) = 0.94  
EFFECTIVE AREA(ACRES) = 39182.03 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 50527.1 PEAK FLOW RATE(CFS) = 36189.84  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 9.23

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 9.23 FLOW VELOCITY(FEET/SEC.) = 15.93  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.00 = 106012.84 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12701.00 TO NODE 12720.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 92.57  
RAINFALL INTENSITY(INCH/HR) = 0.99  
AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.99  
EFFECTIVE STREAM AREA(ACRES) = 39182.03  
TOTAL STREAM AREA(ACRES) = 50527.07  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 36189.84

\*\*\*\*\*

FLOW PROCESS FROM NODE 12710.00 TO NODE 12711.00 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
INITIAL SUBAREA FLOW-LENGTH(FEET) = 943.56  
ELEVATION DATA: UPSTREAM(FEET) = 940.78 DOWNSTREAM(FEET) = 657.79

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.910  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.851  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "GRASS"	-	6.56	0.30	1.000	0	13.91

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 15.06  
TOTAL AREA(ACRES) = 6.56 PEAK FLOW RATE(CFS) = 15.06

\*\*\*\*\*

FLOW PROCESS FROM NODE 12711.00 TO NODE 12712.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 657.79 DOWNSTREAM(FEET) = 585.63  
CHANNEL LENGTH THRU SUBAREA(FEET) = 766.00 CHANNEL SLOPE = 0.0942  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.72

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.560

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	26.94	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 42.53

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.40

AVERAGE FLOW DEPTH(FEET) = 0.69 TRAVEL TIME(MIN.) = 2.36

Tc(MIN.) = 16.27

SUBAREA AREA(ACRES) = 26.94 SUBAREA RUNOFF(CFS) = 54.79

EFFECTIVE AREA(ACRES) = 33.50 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 33.5 PEAK FLOW RATE(CFS) = 68.14

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.91

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.91 FLOW VELOCITY(FEET/SEC.) = 6.33

LONGEST FLOWPATH FROM NODE 12710.00 TO NODE 12712.00 = 1709.56 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12712.00 TO NODE 12713.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 585.63 DOWNSTREAM(FEET) = 463.75  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1025.79 CHANNEL SLOPE = 0.1188  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.95

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.353

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	14.73	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 81.75

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.29

AVERAGE FLOW DEPTH(FEET) = 0.94 TRAVEL TIME(MIN.) = 2.34

Tc(MIN.) = 18.62

SUBAREA AREA(ACRES) = 14.73 SUBAREA RUNOFF(CFS) = 27.22

EFFECTIVE AREA(ACRES) = 48.23 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 48.2 PEAK FLOW RATE(CFS) = 89.12

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.99

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.99 FLOW VELOCITY(FEET/SEC.) = 7.52

LONGEST FLOWPATH FROM NODE 12710.00 TO NODE 12713.00 = 2735.35 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12713.00 TO NODE 12714.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 463.75 DOWNSTREAM(FEET) = 360.30  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1148.54 CHANNEL SLOPE = 0.0901  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.63

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.178

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	105.64	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 178.51

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.51

AVERAGE FLOW DEPTH(FEET) = 1.59 TRAVEL TIME(MIN.) = 2.25

Tc(MIN.) = 20.87

SUBAREA AREA(ACRES) = 105.64 SUBAREA RUNOFF(CFS) = 178.59

EFFECTIVE AREA(ACRES) = 153.87 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 153.9 PEAK FLOW RATE(CFS) = 260.13

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.96

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.96 FLOW VELOCITY(FEET/SEC.) = 9.55

LONGEST FLOWPATH FROM NODE 12710.00 TO NODE 12714.00 = 3883.89 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12714.00 TO NODE 12720.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 360.30 DOWNSTREAM(FEET) = 275.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1314.99 CHANNEL SLOPE = 0.0649  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.58

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.036

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	127.13	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 359.47  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 9.33  
 AVERAGE FLOW DEPTH( FEET) = 2.55 TRAVEL TIME(MIN.) = 2.35  
 Tc(MIN.) = 23.22  
 SUBAREA AREA(ACRES) = 127.13 SUBAREA RUNOFF(CFS) = 198.58  
 EFFECTIVE AREA(ACRES) = 281.00 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 281.0 PEAK FLOW RATE(CFS) = 438.93  
 GIVEN CHANNEL BASE( FEET) = 10.00 CHANNEL FREEBOARD( FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT( FEET) = 2.84

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH( FEET) = 2.84 FLOW VELOCITY( FEET/SEC.) = 9.88  
 LONGEST FLOWPATH FROM NODE 12710.00 TO NODE 12720.00 = 5198.88 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12714.00 TO NODE 12720.00 IS CODE = 1

-----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

-----  
 TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 23.22  
 RAINFALL INTENSITY(INCH/HR) = 2.04  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 281.00  
 TOTAL STREAM AREA(ACRES) = 281.00  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 438.93

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21156.69	18.55	2.359	0.30( 0.30)	0.99	4763.9	40500.00
1	22598.25	22.27	2.093	0.30( 0.30)	0.99	5919.5	40440.00
1	23978.02	27.33	1.837	0.30( 0.30)	0.99	7688.8	31810.00
1	26856.44	39.45	1.482	0.30( 0.30)	0.99	12202.5	40100.00
1	28484.43	48.89	1.324	0.30( 0.30)	0.99	15514.3	11801.00
1	30592.35	60.01	1.203	0.30( 0.30)	0.99	20094.1	11530.00
1	31684.34	64.54	1.172	0.30( 0.30)	0.99	22412.1	11701.00
1	32602.93	68.11	1.148	0.30( 0.30)	0.99	24481.1	11910.00
1	35355.60	78.66	1.077	0.30( 0.30)	0.99	31200.6	10800.00
1	36083.14	82.98	1.047	0.30( 0.30)	0.99	34143.3	11130.00
1	36189.84	92.57	0.989	0.30( 0.30)	0.99	39182.0	12410.00
1	35971.22	100.81	0.953	0.30( 0.30)	0.99	42924.1	11201.00
1	35719.84	105.73	0.932	0.30( 0.30)	0.99	44653.9	12201.00
1	34898.01	112.65	0.902	0.30( 0.30)	0.99	46509.2	12231.00
1	34522.12	115.50	0.889	0.30( 0.30)	0.99	47185.5	12101.10
1	33788.35	120.28	0.869	0.30( 0.30)	0.99	48145.6	10400.00
1	32618.55	128.01	0.854	0.30( 0.30)	0.99	49440.2	12010.00
1	31578.52	133.80	0.842	0.30( 0.30)	0.99	49788.9	10210.00
1	31137.92	136.72	0.836	0.30( 0.30)	0.99	49904.3	12000.00
1	28050.09	161.28	0.786	0.30( 0.30)	0.99	50527.1	10100.00
2	438.93	23.22	2.036	0.30( 0.30)	1.00	281.0	12710.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21572.74	18.55	2.359	0.30( 0.30)	0.99	4988.4	40500.00
2	23033.22	22.27	2.093	0.30( 0.30)	0.99	6189.0	40440.00
3	23295.73	23.22	2.036	0.30( 0.30)	0.99	6532.1	12710.00
4	24366.73	27.33	1.837	0.30( 0.30)	0.99	7969.8	31810.00
5	27155.29	39.45	1.482	0.30( 0.30)	0.99	12483.5	40100.00
6	28743.36	48.89	1.324	0.30( 0.30)	0.99	15795.3	11801.00
7	30820.72	60.01	1.203	0.30( 0.30)	0.99	20375.1	11530.00
8	31904.96	64.54	1.172	0.30( 0.30)	0.99	22693.1	11701.00
9	32817.44	68.11	1.148	0.30( 0.30)	0.99	24762.1	11910.00
10	35552.05	78.66	1.077	0.30( 0.30)	0.99	31481.6	10800.00
11	36272.20	82.98	1.047	0.30( 0.30)	0.99	34424.3	11130.00
12	36364.07	92.57	0.989	0.30( 0.30)	0.99	39463.0	12410.00
13	36136.42	100.81	0.953	0.30( 0.30)	0.99	43205.1	11201.00
14	35879.64	105.73	0.932	0.30( 0.30)	0.99	44934.9	12201.00
15	35050.24	112.65	0.902	0.30( 0.30)	0.99	46790.2	12231.00
16	34671.22	115.50	0.889	0.30( 0.30)	0.99	47466.5	12101.10
17	33932.38	120.28	0.869	0.30( 0.30)	0.99	48426.6	10400.00
18	32758.60	128.01	0.854	0.30( 0.30)	0.99	49721.2	12010.00
19	31715.59	133.80	0.842	0.30( 0.30)	0.99	50069.9	10210.00
20	31273.49	136.72	0.836	0.30( 0.30)	0.99	50185.3	12000.00
21	28173.04	161.28	0.786	0.30( 0.30)	0.99	50808.1	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 36364.07 Tc(MIN.) = 92.57  
 EFFECTIVE AREA(ACRES) = 39463.03 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 50808.1  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.00 = 106012.84 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.00 IS CODE = 12

-----  
 >>>>CLEAR MEMORY BANK # 2 <<<<<

-----  
 \*\*\*MEMORY BANK # 2 IS EMPTY - PROCESS IGNORED.\*\*\*

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.00 IS CODE = 15.1

-----  
 >>>>DEFINE MEMORY BANK # 2 <<<<<

-----  
 PEAK FLOWRATE TABLE FILE NAME: 0610316X.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	336.57	25.48	0.30( 0.30)	0.98		231.4	31600.00
TOTAL AREA(ACRES) =							231.4

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.00 IS CODE = 11

-----  
 >>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<



\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21572.74	18.55	2.359	0.30 ( 0.30)	0.99	4988.4	40500.00
2	23033.22	22.27	2.093	0.30 ( 0.30)	0.99	6189.0	40440.00
3	23295.73	23.22	2.036	0.30 ( 0.30)	0.99	6532.1	12710.00
4	24366.73	27.33	1.837	0.30 ( 0.30)	0.99	7969.8	31810.00
5	27155.29	39.45	1.482	0.30 ( 0.30)	0.99	12483.5	40100.00
6	28743.36	48.89	1.324	0.30 ( 0.30)	0.99	15795.3	11801.00
7	30820.72	60.01	1.203	0.30 ( 0.30)	0.99	20375.1	11530.00
8	31904.96	64.54	1.172	0.30 ( 0.30)	0.99	22693.1	11701.00
9	32817.44	68.11	1.148	0.30 ( 0.30)	0.99	24762.1	11910.00
10	35552.05	78.66	1.077	0.30 ( 0.30)	0.99	31481.6	10800.00
11	36272.20	82.98	1.047	0.30 ( 0.30)	0.99	34424.3	11130.00
12	36364.07	92.57	0.989	0.30 ( 0.30)	0.99	39463.0	12410.00
13	36136.42	100.81	0.953	0.30 ( 0.30)	0.99	43205.1	11201.00
14	35879.64	105.73	0.932	0.30 ( 0.30)	0.99	44934.9	12201.00
15	35050.24	112.65	0.902	0.30 ( 0.30)	0.99	46790.2	12231.00
16	34671.22	115.50	0.889	0.30 ( 0.30)	0.99	47466.5	12101.10
17	33932.38	120.28	0.869	0.30 ( 0.30)	0.99	48426.6	10400.00
18	32758.60	128.01	0.854	0.30 ( 0.30)	0.99	49721.2	12010.00
19	31715.59	133.80	0.842	0.30 ( 0.30)	0.99	50069.9	10210.00
20	31273.49	136.72	0.836	0.30 ( 0.30)	0.99	50185.3	12000.00
21	28173.04	161.28	0.786	0.30 ( 0.30)	0.99	50808.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.00 = 106012.84 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	336.57	25.48	1.908	0.30 ( 0.30)	0.98	231.4	31600.00

LONGEST FLOWPATH FROM NODE 31600.00 TO NODE 12720.00 = 7759.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21886.15	18.55	2.359	0.30 ( 0.30)	0.99	5156.8	40500.00
2	23361.00	22.27	2.093	0.30 ( 0.30)	0.99	6391.2	40440.00
3	23626.51	23.22	2.036	0.30 ( 0.30)	0.99	6742.9	12710.00
4	24221.80	25.48	1.908	0.30 ( 0.30)	0.99	7554.9	31600.00
5	24688.38	27.33	1.837	0.30 ( 0.30)	0.99	8201.2	31810.00
6	27402.83	39.45	1.482	0.30 ( 0.30)	0.99	12714.9	40100.00
7	28957.97	48.89	1.324	0.30 ( 0.30)	0.99	16026.7	11801.00
8	31010.10	60.01	1.203	0.30 ( 0.30)	0.99	20606.5	11530.00
9	32087.95	64.54	1.172	0.30 ( 0.30)	0.99	22924.5	11701.00
10	32995.39	68.11	1.148	0.30 ( 0.30)	0.99	24993.4	11910.00
11	35715.11	78.66	1.077	0.30 ( 0.30)	0.99	31712.9	10800.00
12	36429.16	82.98	1.047	0.30 ( 0.30)	0.99	34655.7	11130.00
13	36508.79	92.57	0.989	0.30 ( 0.30)	0.99	39694.4	12410.00
14	36273.69	100.81	0.953	0.30 ( 0.30)	0.99	43436.5	11201.00
15	36012.47	105.73	0.932	0.30 ( 0.30)	0.99	45166.3	12201.00
16	35176.81	112.65	0.902	0.30 ( 0.30)	0.99	47021.6	12231.00
17	34795.21	115.50	0.889	0.30 ( 0.30)	0.99	47697.9	12101.10
18	34052.18	120.28	0.869	0.30 ( 0.30)	0.99	48658.0	10400.00
19	32875.12	128.01	0.854	0.30 ( 0.30)	0.99	49952.6	12010.00
20	31829.66	133.80	0.842	0.30 ( 0.30)	0.99	50301.2	10210.00
21	31386.33	136.72	0.836	0.30 ( 0.30)	0.99	50416.7	12000.00

22 28275.45 161.28 0.786 0.30 ( 0.30) 0.99 51039.5 10100.00  
TOTAL AREA (ACRES) = 51039.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 36508.79 Tc (MIN.) = 92.570  
EFFECTIVE AREA (ACRES) = 39694.43 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 51039.5  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.00 = 106012.84 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.50 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM (FEET) = 275.00 DOWNSTREAM (FEET) = 258.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2669.21 CHANNEL SLOPE = 0.0064  
GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 9.44  
CHANNEL FLOW THRU SUBAREA (CFS) = 36508.79  
FLOW VELOCITY (FEET/SEC.) = 15.64 FLOW DEPTH (FEET) = 9.44  
TRAVEL TIME (MIN.) = 2.84 Tc (MIN.) = 95.41  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.50 = 108682.05 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12720.50 TO NODE 12720.50 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 2 <<<<<  
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\*\*\*\*\*  
FLOW PROCESS FROM NODE 12720.50 TO NODE 12720.50 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: 0610315X.DNA  
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	106.97	23.96	0.30 ( 0.25)	0.83	68.1	31500.00

TOTAL AREA (ACRES) = 68.1

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12720.50 TO NODE 12720.50 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21886.15	21.92	2.115	0.30 ( 0.30)	0.99	5156.8	40500.00
2	23361.00	25.56	1.905	0.30 ( 0.30)	0.99	6391.2	40440.00
3	23626.51	26.50	1.869	0.30 ( 0.30)	0.99	6742.9	12710.00
4	24221.80	28.74	1.783	0.30 ( 0.30)	0.99	7554.9	31600.00
5	24688.38	30.57	1.719	0.30 ( 0.30)	0.99	8201.2	31810.00

6	27402.83	42.58	1.426	0.30	( 0.30)	0.99	12714.9	40100.00
7	28957.97	51.96	1.286	0.30	( 0.30)	0.99	16026.7	11801.00
8	31010.10	63.01	1.183	0.30	( 0.30)	0.99	20606.5	11530.00
9	32087.95	67.50	1.152	0.30	( 0.30)	0.99	22924.5	11701.00
10	32995.39	71.05	1.128	0.30	( 0.30)	0.99	24993.4	11910.00
11	35715.11	81.52	1.057	0.30	( 0.30)	0.99	31712.9	10800.00
12	36429.16	85.83	1.028	0.30	( 0.30)	0.99	34655.7	11130.00
13	36508.79	95.41	0.977	0.30	( 0.30)	0.99	39694.4	12410.00
14	36273.69	103.66	0.941	0.30	( 0.30)	0.99	43436.5	11201.00
15	36012.47	108.59	0.919	0.30	( 0.30)	0.99	45166.3	12201.00
16	35176.81	115.53	0.889	0.30	( 0.30)	0.99	47021.6	12231.00
17	34795.21	118.39	0.877	0.30	( 0.30)	0.99	47697.9	12101.10
18	34052.18	123.19	0.864	0.30	( 0.30)	0.99	48658.0	10400.00
19	32875.12	130.96	0.848	0.30	( 0.30)	0.99	49952.6	12010.00
20	31829.66	136.78	0.836	0.30	( 0.30)	0.99	50301.2	10210.00
21	31386.33	139.71	0.830	0.30	( 0.30)	0.99	50416.7	12000.00
22	28275.45	164.37	0.780	0.30	( 0.30)	0.99	51039.5	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.50 = 108682.05 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	106.97	23.96	1.990	0.30	( 0.25)	0.83	68.1 31500.00

LONGEST FLOWPATH FROM NODE 31500.00 TO NODE 12720.50 = 4043.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21990.97	21.92	2.115	0.30	( 0.30)	0.99	5219.1 40500.00
2	22820.50	23.96	1.990	0.30	( 0.30)	0.99	5917.4 31500.00
3	23462.76	25.56	1.905	0.30	( 0.30)	0.99	6459.3 40440.00
4	23726.05	26.50	1.869	0.30	( 0.30)	0.99	6811.0 12710.00
5	24316.04	28.74	1.783	0.30	( 0.30)	0.99	7623.0 31600.00
6	24778.69	30.57	1.719	0.30	( 0.30)	0.99	8269.3 31810.00
7	27475.13	42.58	1.426	0.30	( 0.30)	0.99	12783.0 40100.00
8	29021.70	51.96	1.286	0.30	( 0.30)	0.99	16094.8 11801.00
9	31067.50	63.01	1.183	0.30	( 0.30)	0.99	20674.6 11530.00
10	32143.48	67.50	1.152	0.30	( 0.30)	0.99	22992.6 11701.00
11	33049.44	71.05	1.128	0.30	( 0.30)	0.99	25061.5 11910.00
12	35764.82	81.52	1.057	0.30	( 0.30)	0.99	31781.0 10800.00
13	36477.07	85.83	1.028	0.30	( 0.30)	0.99	34723.8 11130.00
14	36553.53	95.41	0.977	0.30	( 0.30)	0.99	39762.5 12410.00
15	36316.23	103.66	0.941	0.30	( 0.30)	0.99	43504.6 11201.00
16	36053.70	108.59	0.919	0.30	( 0.30)	0.99	45234.4 12201.00
17	35216.20	115.53	0.889	0.30	( 0.30)	0.99	47089.7 12231.00
18	34833.84	118.39	0.877	0.30	( 0.30)	0.99	47766.0 12101.10
19	34089.98	123.19	0.864	0.30	( 0.30)	0.99	48726.1 10400.00
20	32911.96	130.96	0.848	0.30	( 0.30)	0.99	50020.7 12010.00
21	31865.77	136.78	0.836	0.30	( 0.30)	0.99	50369.3 10210.00
22	31422.06	139.71	0.830	0.30	( 0.30)	0.99	50484.8 12000.00
23	28308.11	164.37	0.780	0.30	( 0.30)	0.99	51107.6 10100.00

TOTAL AREA (ACRES) = 51107.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 36553.53 Tc(MIN.) = 95.414  
EFFECTIVE AREA(ACRES) = 39762.52 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 51107.6

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.50 = 108682.05 FEET.

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FLOW PROCESS FROM NODE 12720.50 TO NODE 12721.00 IS CODE = 56

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 258.00 DOWNSTREAM(FEET) = 256.00

CHANNEL LENGTH THRU SUBAREA(FEET) = 438.77 CHANNEL SLOPE = 0.0046

GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.38

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 0.974

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	62.15	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 36572.39

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.99

AVERAGE FLOW DEPTH(FEET) = 10.38 TRAVEL TIME(MIN.) = 0.52

Tc(MIN.) = 95.94

SUBAREA AREA(ACRES) = 62.15 SUBAREA RUNOFF(CFS) = 37.72

EFFECTIVE AREA(ACRES) = 39824.67 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99

TOTAL AREA(ACRES) = 51169.7 PEAK FLOW RATE(CFS) = 36553.53

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.38

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 10.38 FLOW VELOCITY(FEET/SEC.) = 13.98

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12721.00 = 109120.82 FEET.

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FLOW PROCESS FROM NODE 12721.00 TO NODE 12722.00 IS CODE = 56

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 256.00 DOWNSTREAM(FEET) = 255.00

CHANNEL LENGTH THRU SUBAREA(FEET) = 830.42 CHANNEL SLOPE = 0.0012

GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 15.01

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 0.968

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	11.24	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 36556.91

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.85

AVERAGE FLOW DEPTH(FEET) = 15.01 TRAVEL TIME(MIN.) = 1.56

Tc(MIN.) = 97.50  
 SUBAREA AREA(ACRES) = 11.24 SUBAREA RUNOFF(CFS) = 6.75  
 EFFECTIVE AREA(ACRES) = 39835.91 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 51180.9 PEAK FLOW RATE(CFS) = 36553.53  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 15.01

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 15.01 FLOW VELOCITY(FEET/SEC.) = 8.85  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12722.00 = 109951.24 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12722.00 TO NODE 12722.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610314X.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	566.88	36.46	0.30( 0.30)	0.99	497.2	31400.00
TOTAL AREA(ACRES) = 497.2						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12722.00 TO NODE 12722.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21990.97	24.36	1.966	0.30( 0.30)	0.99	5292.5	40500.00
2	22820.50	26.38	1.874	0.30( 0.30)	0.99	5990.8	31500.00
3	23462.76	27.96	1.813	0.30( 0.30)	0.99	6532.7	40440.00
4	23726.05	28.89	1.777	0.30( 0.30)	0.99	6884.4	12710.00
5	24316.04	31.11	1.704	0.30( 0.30)	0.99	7696.3	31600.00
6	24778.69	32.93	1.656	0.30( 0.30)	0.99	8342.7	31810.00
7	27475.13	44.86	1.389	0.30( 0.30)	0.99	12856.4	40100.00
8	29021.70	54.20	1.263	0.30( 0.30)	0.99	16168.2	11801.00
9	31067.50	65.21	1.168	0.30( 0.30)	0.99	20748.0	11530.00
10	32143.48	69.68	1.138	0.30( 0.30)	0.99	23065.9	11701.00
11	33049.44	73.20	1.114	0.30( 0.30)	0.99	25134.9	11910.00
12	35764.82	83.62	1.043	0.30( 0.30)	0.99	31854.4	10800.00
13	36477.07	87.91	1.014	0.30( 0.30)	0.99	34797.2	11130.00
14	36553.53	97.50	0.968	0.30( 0.30)	0.99	39835.9	12410.00
15	36316.23	105.75	0.932	0.30( 0.30)	0.99	43578.0	11201.00
16	36053.70	110.68	0.910	0.30( 0.30)	0.99	45307.7	12201.00
17	35216.20	117.64	0.880	0.30( 0.30)	0.99	47163.1	12231.00
18	34833.84	120.51	0.869	0.30( 0.30)	0.99	47839.4	12101.10
19	34089.98	125.32	0.859	0.30( 0.30)	0.99	48799.5	10400.00
20	32911.96	133.11	0.843	0.30( 0.30)	0.99	50094.0	12010.00
21	31865.77	138.95	0.831	0.30( 0.30)	0.99	50442.7	10210.00
22	31422.06	141.90	0.825	0.30( 0.30)	0.99	50558.2	12000.00
23	28308.11	166.63	0.775	0.30( 0.30)	0.99	51180.9	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12722.00 = 109951.24 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	566.88	36.46	1.561	0.30( 0.30)	0.99	497.2	31400.00

LONGEST FLOWPATH FROM NODE 31400.00 TO NODE 12722.00 = 14614.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22490.85	24.36	1.966	0.30( 0.30)	0.99	5624.7	40500.00
2	23331.94	26.38	1.874	0.30( 0.30)	0.99	6350.5	31500.00
3	23983.86	27.96	1.813	0.30( 0.30)	0.99	6914.0	40440.00
4	24251.72	28.89	1.777	0.30( 0.30)	0.99	7278.3	12710.00
5	24854.38	31.11	1.704	0.30( 0.30)	0.99	8120.6	31600.00
6	25328.83	32.93	1.656	0.30( 0.30)	0.99	8791.7	31810.00
7	26144.45	36.46	1.561	0.30( 0.30)	0.99	10177.2	31400.00
8	27964.62	44.86	1.389	0.30( 0.30)	0.99	13353.6	40100.00
9	29454.64	54.20	1.263	0.30( 0.30)	0.99	16665.4	11801.00
10	31457.88	65.21	1.168	0.30( 0.30)	0.99	21245.2	11530.00
11	32520.30	69.68	1.138	0.30( 0.30)	0.99	23563.1	11701.00
12	33415.56	73.20	1.114	0.30( 0.30)	0.99	25632.1	11910.00
13	36099.33	83.62	1.043	0.30( 0.30)	0.99	32351.6	10800.00
14	36798.57	87.91	1.014	0.30( 0.30)	0.99	35294.4	11130.00
15	36854.13	97.50	0.968	0.30( 0.30)	0.99	40333.1	12410.00
16	36600.80	105.75	0.932	0.30( 0.30)	0.99	44075.2	11201.00
17	36328.69	110.68	0.910	0.30( 0.30)	0.99	45804.9	12201.00
18	35477.68	117.64	0.880	0.30( 0.30)	0.99	47660.3	12231.00
19	35090.27	120.51	0.869	0.30( 0.30)	0.99	48336.6	12101.10
20	34342.02	125.32	0.859	0.30( 0.30)	0.99	49296.7	10400.00
21	33156.89	133.11	0.843	0.30( 0.30)	0.99	50591.2	12010.00
22	32105.38	138.95	0.831	0.30( 0.30)	0.99	50939.9	10210.00
23	31658.99	141.90	0.825	0.30( 0.30)	0.99	51055.4	12000.00
24	28522.49	166.63	0.775	0.30( 0.30)	0.99	51678.1	10100.00
TOTAL AREA(ACRES) =							51678.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 36854.13 Tc(MIN.) = 97.500  
 EFFECTIVE AREA(ACRES) = 40333.11 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 51678.1  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12722.00 = 109951.24 FEET.

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 FLOW PROCESS FROM NODE 12722.00 TO NODE 12740.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 255.00 DOWNSTREAM(FEET) = 252.10  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 624.00 CHANNEL SLOPE = 0.0046  
 GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 10.37  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 0.964  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
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LAND USE      GROUP  (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED  -        62.42    0.30      1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 36872.79
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.11
AVERAGE FLOW DEPTH(FEET) = 10.37 TRAVEL TIME(MIN.) = 0.74
Tc(MIN.) = 98.24
SUBAREA AREA(ACRES) = 62.42 SUBAREA RUNOFF(CFS) = 37.32
EFFECTIVE AREA(ACRES) = 40395.53 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 51740.6 PEAK FLOW RATE(CFS) = 36854.13
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 10.37

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 10.37 FLOW VELOCITY(FEET/SEC.) = 14.11
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12740.00 = 110575.24 FEET.

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FLOW PROCESS FROM NODE 12722.00 TO NODE 12740.00 IS CODE = 1

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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

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TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 98.24
RAINFALL INTENSITY(INCH/HR) = 0.96
AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99
EFFECTIVE STREAM AREA(ACRES) = 40395.53
TOTAL STREAM AREA(ACRES) = 51740.56
PEAK FLOW RATE(CFS) AT CONFLUENCE = 36854.13

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*****
FLOW PROCESS FROM NODE 12730.00 TO NODE 12731.00 IS CODE = 21

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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

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INITIAL SUBAREA FLOW-LENGTH(FEET) = 561.54
ELEVATION DATA: UPSTREAM(FEET) = 613.29 DOWNSTREAM(FEET) = 551.75

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.823
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.866
SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" - 6.33 0.30 1.000 0 13.82
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 14.62
TOTAL AREA(ACRES) = 6.33 PEAK FLOW RATE(CFS) = 14.62

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*****
FLOW PROCESS FROM NODE 12731.00 TO NODE 12732.00 IS CODE = 56

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

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>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 551.75 DOWNSTREAM(FEET) = 494.40
CHANNEL LENGTH THRU SUBAREA(FEET) = 971.91 CHANNEL SLOPE = 0.0590
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 0.91
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.482
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 34.62 0.30 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 48.79
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.86
AVERAGE FLOW DEPTH(FEET) = 0.86 TRAVEL TIME(MIN.) = 3.33
Tc(MIN.) = 17.16
SUBAREA AREA(ACRES) = 34.62 SUBAREA RUNOFF(CFS) = 67.98
EFFECTIVE AREA(ACRES) = 40.95 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 40.9 PEAK FLOW RATE(CFS) = 80.41
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.14

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.14 FLOW VELOCITY(FEET/SEC.) = 5.73
LONGEST FLOWPATH FROM NODE 12730.00 TO NODE 12732.00 = 1533.45 FEET.

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*****
FLOW PROCESS FROM NODE 12732.00 TO NODE 12733.00 IS CODE = 56

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

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>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 494.40 DOWNSTREAM(FEET) = 431.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1156.41 CHANNEL SLOPE = 0.0548
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.59
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.224
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 59.52 0.30 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 132.02
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.53
AVERAGE FLOW DEPTH(FEET) = 1.54 TRAVEL TIME(MIN.) = 2.95
Tc(MIN.) = 20.11
SUBAREA AREA(ACRES) = 59.52 SUBAREA RUNOFF(CFS) = 103.09

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EFFECTIVE AREA (ACRES) = 100.47 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 100.5 PEAK FLOW RATE (CFS) = 174.02  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.80

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.80 FLOW VELOCITY (FEET/SEC.) = 7.12  
 LONGEST FLOWPATH FROM NODE 12730.00 TO NODE 12733.00 = 2689.86 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12733.00 TO NODE 12734.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 431.00 DOWNSTREAM (FEET) = 367.11  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1654.48 CHANNEL SLOPE = 0.0386  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.31  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.977

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	64.05	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 222.39  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.77  
 AVERAGE FLOW DEPTH (FEET) = 2.26 TRAVEL TIME (MIN.) = 4.08  
 Tc (MIN.) = 24.18

SUBAREA AREA (ACRES) = 64.05 SUBAREA RUNOFF (CFS) = 96.65  
 EFFECTIVE AREA (ACRES) = 164.52 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 164.5 PEAK FLOW RATE (CFS) = 248.26  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.41

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.41 FLOW VELOCITY (FEET/SEC.) = 6.97  
 LONGEST FLOWPATH FROM NODE 12730.00 TO NODE 12734.00 = 4344.34 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12734.00 TO NODE 12740.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 367.11 DOWNSTREAM (FEET) = 252.10  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1880.98 CHANNEL SLOPE = 0.0611  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.22  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.814

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/  
LAND USE

SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	26.02	0.30	1.000

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 265.99  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.39  
 AVERAGE FLOW DEPTH (FEET) = 2.20 TRAVEL TIME (MIN.) = 3.74  
 Tc (MIN.) = 27.92

SUBAREA AREA (ACRES) = 26.02 SUBAREA RUNOFF (CFS) = 35.46  
 EFFECTIVE AREA (ACRES) = 190.54 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 190.5 PEAK FLOW RATE (CFS) = 259.68  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.18

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.18 FLOW VELOCITY (FEET/SEC.) = 8.31  
 LONGEST FLOWPATH FROM NODE 12730.00 TO NODE 12740.00 = 6225.32 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12734.00 TO NODE 12740.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION (MIN.) = 27.92  
 RAINFALL INTENSITY (INCH/HR) = 1.81  
 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA (ACRES) = 190.54  
 TOTAL STREAM AREA (ACRES) = 190.54  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 259.68

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22490.85	25.23	1.918	0.30 ( 0.30)	0.99	5687.2	40500.00
1	23331.94	27.24	1.841	0.30 ( 0.30)	0.99	6413.0	31500.00
1	23983.86	28.81	1.780	0.30 ( 0.30)	0.99	6976.4	40440.00
1	24251.72	29.73	1.744	0.30 ( 0.30)	0.99	7340.7	12710.00
1	24854.38	31.95	1.682	0.30 ( 0.30)	0.99	8183.0	31600.00
1	25328.83	33.76	1.634	0.30 ( 0.30)	0.99	8854.2	31810.00
1	26144.45	37.29	1.539	0.30 ( 0.30)	0.99	10239.6	31400.00
1	27964.62	45.66	1.376	0.30 ( 0.30)	0.99	13416.0	40100.00
1	29454.64	55.00	1.255	0.30 ( 0.30)	0.99	16727.8	11801.00
1	31457.88	65.98	1.163	0.30 ( 0.30)	0.99	21307.6	11530.00
1	32520.30	70.44	1.132	0.30 ( 0.30)	0.99	23625.6	11701.00
1	33415.56	73.96	1.109	0.30 ( 0.30)	0.99	25694.6	11910.00
1	36099.33	84.36	1.038	0.30 ( 0.30)	0.99	32414.1	10800.00
1	36798.57	88.65	1.009	0.30 ( 0.30)	0.99	35356.8	11130.00
1	36854.13	98.24	0.964	0.30 ( 0.30)	0.99	40395.5	12410.00
1	36600.80	106.49	0.929	0.30 ( 0.30)	0.99	44137.6	11201.00
1	36328.69	111.42	0.907	0.30 ( 0.30)	0.99	45867.4	12201.00

1	35477.68	118.38	0.877	0.30 ( 0.30)	0.99	47722.7	12231.00
1	35090.27	121.26	0.867	0.30 ( 0.30)	0.99	48399.0	12101.10
1	34342.02	126.07	0.858	0.30 ( 0.30)	0.99	49359.1	10400.00
1	33156.89	133.87	0.842	0.30 ( 0.30)	0.99	50653.7	12010.00
1	32105.38	139.73	0.830	0.30 ( 0.30)	0.99	51002.3	10210.00
1	31658.99	142.67	0.824	0.30 ( 0.30)	0.99	51117.8	12000.00
1	28522.49	167.43	0.774	0.30 ( 0.30)	0.99	51740.6	10100.00
2	259.68	27.92	1.814	0.30 ( 0.30)	1.00	190.5	12730.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22741.60	25.23	1.918	0.30 ( 0.30)	0.99	5859.3	40500.00
2	23589.67	27.24	1.841	0.30 ( 0.30)	0.99	6598.8	31500.00
3	23875.48	27.92	1.814	0.30 ( 0.30)	0.99	6848.8	12730.00
4	24237.66	28.81	1.780	0.30 ( 0.30)	0.99	7166.9	40440.00
5	24499.40	29.73	1.744	0.30 ( 0.30)	0.99	7531.3	12710.00
6	25091.38	31.95	1.682	0.30 ( 0.30)	0.99	8373.5	31600.00
7	25557.53	33.76	1.634	0.30 ( 0.30)	0.99	9044.7	31810.00
8	26357.01	37.29	1.539	0.30 ( 0.30)	0.99	10430.2	31400.00
9	28149.12	45.66	1.376	0.30 ( 0.30)	0.99	13606.6	40100.00
10	29618.34	55.00	1.255	0.30 ( 0.30)	0.99	16918.4	11801.00
11	31605.81	65.98	1.163	0.30 ( 0.30)	0.99	21498.2	11530.00
12	32663.05	70.44	1.132	0.30 ( 0.30)	0.99	23816.1	11701.00
13	33554.22	73.96	1.109	0.30 ( 0.30)	0.99	25885.1	11910.00
14	36225.92	84.36	1.038	0.30 ( 0.30)	0.99	32604.6	10800.00
15	36920.19	88.65	1.009	0.30 ( 0.30)	0.99	35547.3	11130.00
16	36968.06	98.24	0.964	0.30 ( 0.30)	0.99	40586.1	12410.00
17	36708.59	106.49	0.929	0.30 ( 0.30)	0.99	44328.2	11201.00
18	36432.82	111.42	0.907	0.30 ( 0.30)	0.99	46057.9	12201.00
19	35576.64	118.38	0.877	0.30 ( 0.30)	0.99	47913.3	12231.00
20	35187.59	121.26	0.867	0.30 ( 0.30)	0.99	48589.5	12101.10
21	34437.66	126.07	0.858	0.30 ( 0.30)	0.99	49549.7	10400.00
22	33249.82	133.87	0.842	0.30 ( 0.30)	0.99	50844.2	12010.00
23	32196.26	139.73	0.830	0.30 ( 0.30)	0.99	51192.9	10210.00
24	31748.85	142.67	0.824	0.30 ( 0.30)	0.99	51308.4	12000.00
25	28603.71	167.43	0.774	0.30 ( 0.30)	0.99	51931.1	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 36968.06 Tc(MIN.) = 98.24  
EFFECTIVE AREA(ACRES) = 40586.07 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 51931.1  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12740.00 = 110575.24 FEET.

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FLOW PROCESS FROM NODE 12740.00 TO NODE 12741.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 252.10 DOWNSTREAM(FEET) = 247.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 401.47 CHANNEL SLOPE = 0.0127  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.81  
CHANNEL FLOW THRU SUBAREA(CFS) = 36968.06  
FLOW VELOCITY(FEET/SEC.) = 19.80 FLOW DEPTH(FEET) = 7.81  
TRAVEL TIME(MIN.) = 0.34 Tc(MIN.) = 98.57  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12741.00 = 110976.71 FEET.

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FLOW PROCESS FROM NODE 12741.00 TO NODE 12741.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<

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FLOW PROCESS FROM NODE 12741.00 TO NODE 12741.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<

PEAK FLOWRATE TABLE FILE NAME: 0610313X.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	209.49	22.94	0.30 ( 0.29)	0.97	132.0	31300.00
TOTAL AREA(ACRES) =						132.0

\*\*\*\*\*

FLOW PROCESS FROM NODE 12741.00 TO NODE 12741.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22741.60	25.63	1.903	0.30 ( 0.30)	0.99	5859.3	40500.00
2	23589.67	27.63	1.825	0.30 ( 0.30)	0.99	6598.8	31500.00
3	23875.48	28.31	1.799	0.30 ( 0.30)	0.99	6848.8	12730.00
4	24237.66	29.20	1.765	0.30 ( 0.30)	0.99	7166.9	40440.00
5	24499.40	30.12	1.731	0.30 ( 0.30)	0.99	7531.3	12710.00
6	25091.38	32.33	1.672	0.30 ( 0.30)	0.99	8373.5	31600.00
7	25557.53	34.14	1.623	0.30 ( 0.30)	0.99	9044.7	31810.00
8	26357.01	37.67	1.529	0.30 ( 0.30)	0.99	10430.2	31400.00
9	28149.12	46.03	1.370	0.30 ( 0.30)	0.99	13606.6	40100.00
10	29618.34	55.36	1.251	0.30 ( 0.30)	0.99	16918.4	11801.00
11	31605.81	66.34	1.160	0.30 ( 0.30)	0.99	21498.2	11530.00
12	32663.05	70.80	1.130	0.30 ( 0.30)	0.99	23816.1	11701.00
13	33554.22	74.31	1.106	0.30 ( 0.30)	0.99	25885.1	11910.00
14	36225.92	84.70	1.036	0.30 ( 0.30)	0.99	32604.6	10800.00
15	36920.19	88.99	1.007	0.30 ( 0.30)	0.99	35547.3	11130.00
16	36968.06	98.57	0.963	0.30 ( 0.30)	0.99	40586.1	12410.00
17	36708.59	106.83	0.927	0.30 ( 0.30)	0.99	44328.2	11201.00
18	36432.82	111.76	0.906	0.30 ( 0.30)	0.99	46057.9	12201.00
19	35576.64	118.72	0.876	0.30 ( 0.30)	0.99	47913.3	12231.00
20	35187.59	121.60	0.867	0.30 ( 0.30)	0.99	48589.5	12101.10
21	34437.66	126.42	0.857	0.30 ( 0.30)	0.99	49549.7	10400.00
22	33249.82	134.22	0.841	0.30 ( 0.30)	0.99	50844.2	12010.00
23	32196.26	140.08	0.829	0.30 ( 0.30)	0.99	51192.9	10210.00
24	31748.85	143.02	0.823	0.30 ( 0.30)	0.99	51308.4	12000.00
25	28603.71	167.80	0.773	0.30 ( 0.30)	0.99	51931.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12741.00 = 110976.71 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	209.49	22.94	2.052	0.30 ( 0.29)	0.97	132.0	31300.00

LONGEST FLOWPATH FROM NODE 31300.00 TO NODE 12741.00 = 5775.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22461.03	22.94	2.052	0.30 ( 0.30)	0.99	5376.9	31300.00
2	22933.31	25.63	1.903	0.30 ( 0.30)	0.99	5991.3	40500.00
3	23772.19	27.63	1.825	0.30 ( 0.30)	0.99	6730.8	31500.00
4	24054.87	28.31	1.799	0.30 ( 0.30)	0.99	6980.8	12730.00
5	24412.98	29.20	1.765	0.30 ( 0.30)	0.99	7298.9	40440.00
6	24670.65	30.12	1.731	0.30 ( 0.30)	0.99	7663.2	12710.00
7	25255.60	32.33	1.672	0.30 ( 0.30)	0.99	8505.5	31600.00
8	25716.01	34.14	1.623	0.30 ( 0.30)	0.99	9176.7	31810.00
9	26504.30	37.67	1.529	0.30 ( 0.30)	0.99	10562.1	31400.00
10	28277.43	46.03	1.370	0.30 ( 0.30)	0.99	13738.5	40100.00
11	29732.48	55.36	1.251	0.30 ( 0.30)	0.99	17050.3	11801.00
12	31709.16	66.34	1.160	0.30 ( 0.30)	0.99	21630.1	11530.00
13	32762.81	70.80	1.130	0.30 ( 0.30)	0.99	23948.1	11701.00
14	33651.15	74.31	1.106	0.30 ( 0.30)	0.99	26017.1	11910.00
15	36314.48	84.70	1.036	0.30 ( 0.30)	0.99	32736.6	10800.00
16	37005.30	88.99	1.007	0.30 ( 0.30)	0.99	35679.3	11130.00
17	37047.93	98.57	0.963	0.30 ( 0.30)	0.99	40718.0	12410.00
18	36784.21	106.83	0.927	0.30 ( 0.30)	0.99	44460.2	11201.00
19	36505.89	111.76	0.906	0.30 ( 0.30)	0.99	46189.9	12201.00
20	35646.12	118.72	0.876	0.30 ( 0.30)	0.99	48045.2	12231.00
21	35256.03	121.60	0.867	0.30 ( 0.30)	0.99	48721.5	12101.10
22	34504.94	126.42	0.857	0.30 ( 0.30)	0.99	49681.6	10400.00
23	33315.20	134.22	0.841	0.30 ( 0.30)	0.99	50976.2	12010.00
24	32260.23	140.08	0.829	0.30 ( 0.30)	0.99	51324.9	10210.00
25	31812.10	143.02	0.823	0.30 ( 0.30)	0.99	51440.3	12000.00
26	28660.98	167.80	0.773	0.30 ( 0.30)	0.99	52063.1	10100.00

TOTAL AREA (ACRES) = 52063.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 37047.93 Tc (MIN.) = 98.575  
EFFECTIVE AREA (ACRES) = 40718.04 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 52063.1  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12741.00 = 110976.71 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12741.00 TO NODE 12800.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 247.00 DOWNSTREAM (FEET) = 240.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 819.00 CHANNEL SLOPE = 0.0085  
GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 8.76  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 0.959

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	17.31	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 37053.07  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 17.36  
AVERAGE FLOW DEPTH (FEET) = 8.76 TRAVEL TIME (MIN.) = 0.79  
Tc (MIN.) = 99.36  
SUBAREA AREA (ACRES) = 17.31 SUBAREA RUNOFF (CFS) = 10.27  
EFFECTIVE AREA (ACRES) = 40735.35 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 52080.4 PEAK FLOW RATE (CFS) = 37047.93  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 8.76

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 8.76 FLOW VELOCITY (FEET/SEC.) = 17.36  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12800.00 = 111795.71 FEET.

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 52080.4 TC (MIN.) = 99.36  
EFFECTIVE AREA (ACRES) = 40735.35 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.993  
PEAK FLOW RATE (CFS) = 37047.93

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22461.03	23.87	1.996	0.30 ( 0.30)	0.99	5394.2	31300.00
2	22933.31	26.55	1.867	0.30 ( 0.30)	0.99	6008.6	40500.00
3	23772.19	28.54	1.790	0.30 ( 0.30)	0.99	6748.1	31500.00
4	24054.87	29.22	1.764	0.30 ( 0.30)	0.99	6998.1	12730.00
5	24412.98	30.10	1.731	0.30 ( 0.30)	0.99	7316.2	40440.00
6	24670.65	31.02	1.707	0.30 ( 0.30)	0.99	7680.5	12710.00
7	25255.60	33.23	1.648	0.30 ( 0.30)	0.99	8522.8	31600.00
8	25716.01	35.03	1.600	0.30 ( 0.30)	0.99	9194.0	31810.00
9	26504.30	38.55	1.506	0.30 ( 0.30)	0.99	10579.4	31400.00
10	28277.43	46.89	1.356	0.30 ( 0.30)	0.99	13755.9	40100.00
11	29732.48	56.21	1.242	0.30 ( 0.30)	0.99	17067.7	11801.00
12	31709.16	67.17	1.155	0.30 ( 0.30)	0.99	21647.4	11530.00
13	32762.81	71.61	1.124	0.30 ( 0.30)	0.99	23965.4	11701.00
14	33651.15	75.12	1.101	0.30 ( 0.30)	0.99	26034.4	11910.00
15	36314.48	85.50	1.030	0.30 ( 0.30)	0.99	32753.9	10800.00
16	37005.30	89.78	1.002	0.30 ( 0.30)	0.99	35696.6	11130.00
17	37047.93	99.36	0.959	0.30 ( 0.30)	0.99	40735.3	12410.00
18	36784.21	107.62	0.924	0.30 ( 0.30)	0.99	44477.5	11201.00
19	36505.89	112.55	0.902	0.30 ( 0.30)	0.99	46207.2	12201.00
20	35646.12	119.52	0.872	0.30 ( 0.30)	0.99	48062.5	12231.00
21	35256.03	122.40	0.865	0.30 ( 0.30)	0.99	48738.8	12101.10
22	34504.94	127.22	0.855	0.30 ( 0.30)	0.99	49699.0	10400.00
23	33315.20	135.04	0.839	0.30 ( 0.30)	0.99	50993.5	12010.00
24	32260.23	140.90	0.827	0.30 ( 0.30)	0.99	51342.2	10210.00
25	31812.10	143.85	0.822	0.30 ( 0.30)	0.99	51457.7	12000.00
26	28660.98	168.66	0.771	0.30 ( 0.30)	0.99	52080.4	10100.00

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END OF RATIONAL METHOD ANALYSIS



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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

-----  
FILE NAME: S28.DAT  
TIME/DATE OF STUDY: 09:47 09/12/2017  
=====

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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
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--\*TIME-OF-CONCENTRATION MODEL\*--  
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USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14  
1) 5.00; 5.460  
2) 10.00; 3.494  
3) 15.00; 2.672  
4) 20.00; 2.231  
5) 25.00; 1.927  
6) 30.00; 1.734  
7) 40.00; 1.467  
8) 50.00; 1.306  
9) 60.00; 1.203  
10) 90.00; 1.000  
11) 120.00; 0.870  
12) 180.00; 0.748  
13) 360.00; 0.556  
14) 1200.00; 0.244  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*  
HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING  
WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR  
NO. (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) (n)  
=== =====  
1 30.0 20.0 0.018/0.018/0.020 0.67 2.00 0.0312 0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 12800.00 TO NODE 12800.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<<  
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PEAK FLOWRATE TABLE FILE NAME: 0610501X.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1506.93	25.94	0.30 ( 0.29)	0.98	1025.8	50120.00
2	1480.85	27.19	0.30 ( 0.29)	0.98	1040.8	50150.00
3	1382.53	30.77	0.30 ( 0.29)	0.98	1063.4	50100.00
TOTAL AREA (ACRES) =		1063.4				

\*\*\*\*\*

FLOW PROCESS FROM NODE 12800.00 TO NODE 12800.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1506.93	25.94	0.30 ( 0.29)	0.98	1025.8	50120.00
2	1480.85	27.19	0.30 ( 0.29)	0.98	1040.8	50150.00
3	1382.53	30.77	0.30 ( 0.29)	0.98	1063.4	50100.00
TOTAL AREA (ACRES) =		1063.4				

-----  
END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 1063.4 TC (MIN.) = 25.94  
EFFECTIVE AREA (ACRES) = 1025.75 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.981  
PEAK FLOW RATE (CFS) = 1506.93

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1506.93	25.94	1.891	0.30 ( 0.29)	0.98	1025.8	50120.00
2	1480.85	27.19	1.842	0.30 ( 0.29)	0.98	1040.8	50150.00
3	1382.53	30.77	1.713	0.30 ( 0.29)	0.98	1063.4	50100.00

-----  
END OF RATIONAL METHOD ANALYSIS  
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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

-----  
FILE NAME: S29.DAT  
TIME/DATE OF STUDY: 09:47 09/12/2017  
=====

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--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*

NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.442
- 2) 10.00; 3.485
- 3) 15.00; 2.667
- 4) 20.00; 2.227
- 5) 25.00; 1.925
- 6) 30.00; 1.732
- 7) 40.00; 1.466
- 8) 50.00; 1.304
- 9) 60.00; 1.201
- 10) 90.00; 0.998
- 11) 120.00; 0.867
- 12) 180.00; 0.746
- 13) 360.00; 0.553
- 14) 1200.00; 0.243

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 12740.00 TO NODE 12800.00 IS CODE = 15.1

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>>>>DEFINE MEMORY BANK # 1 <<<<<<  
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PEAK FLOWRATE TABLE FILE NAME: S27.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22933.31	26.55	0.30 ( 0.30)	0.99	6008.6	40500.00
2	24670.65	31.02	0.30 ( 0.30)	0.99	7680.5	12710.00
3	25716.01	35.03	0.30 ( 0.30)	0.99	9194.0	31810.00
4	26504.30	38.55	0.30 ( 0.30)	0.99	10579.4	31400.00
5	28277.43	46.89	0.30 ( 0.30)	0.99	13755.9	40100.00
6	29732.48	56.21	0.30 ( 0.30)	0.99	17067.7	11801.00
7	31709.16	67.17	0.30 ( 0.30)	0.99	21647.4	11530.00
8	32762.81	71.61	0.30 ( 0.30)	0.99	23965.4	11701.00
9	33651.15	75.12	0.30 ( 0.30)	0.99	26034.4	11910.00
10	36314.48	85.50	0.30 ( 0.30)	0.99	32753.9	10800.00
11	37005.30	89.78	0.30 ( 0.30)	0.99	35696.6	11130.00
12	37047.93	99.36	0.30 ( 0.30)	0.99	40735.3	12410.00
13	36784.21	107.62	0.30 ( 0.30)	0.99	44477.5	11201.00
14	36505.89	112.55	0.30 ( 0.30)	0.99	46207.2	12201.00
15	35646.12	119.52	0.30 ( 0.30)	0.99	48062.5	12231.00
16	34504.94	127.22	0.30 ( 0.30)	0.99	49699.0	10400.00
17	33315.20	135.04	0.30 ( 0.30)	0.99	50993.5	12010.00
18	32260.23	140.90	0.30 ( 0.30)	0.99	51342.2	10210.00
19	31812.10	143.85	0.30 ( 0.30)	0.99	51457.7	12000.00
20	28660.98	168.66	0.30 ( 0.30)	0.99	52080.4	10100.00

TOTAL AREA (ACRES) = 52080.4

\*\*\*\*\*

FLOW PROCESS FROM NODE 12800.00 TO NODE 12800.00 IS CODE = 15.1

-----  
>>>>DEFINE MEMORY BANK # 2 <<<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: S28.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1506.93	25.94	0.30 ( 0.29)	0.98	1025.8	50120.00
2	1480.85	27.19	0.30 ( 0.29)	0.98	1040.8	50150.00
3	1382.53	30.77	0.30 ( 0.29)	0.98	1063.4	50100.00

TOTAL AREA (ACRES) = 1063.4

\*\*\*\*\*

FLOW PROCESS FROM NODE 12800.00 TO NODE 12800.00 IS CODE = 14.0

-----  
>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1506.93	25.94	0.30 ( 0.29)	0.98	1025.8	50120.00
2	1480.85	27.19	0.30 ( 0.29)	0.98	1040.8	50150.00
3	1382.53	30.77	0.30 ( 0.29)	0.98	1063.4	50100.00

TOTAL AREA (ACRES) = 1063.4

\*\*\*\*\*

FLOW PROCESS FROM NODE 12740.00 TO NODE 12800.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1506.93	25.94	1.889	0.30 ( 0.29)	0.98	1025.8	50120.00
2	1480.85	27.19	1.840	0.30 ( 0.29)	0.98	1040.8	50150.00
3	1382.53	30.77	1.712	0.30 ( 0.29)	0.98	1063.4	50100.00

LONGEST FLOWPATH FROM NODE 50150.00 TO NODE 12800.00 = 11349.00 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22933.31	26.55	1.865	0.30 ( 0.30)	0.99	6008.6	40500.00
2	24670.65	31.02	1.705	0.30 ( 0.30)	0.99	7680.5	12710.00
3	25716.01	35.03	1.598	0.30 ( 0.30)	0.99	9194.0	31810.00
4	26504.30	38.55	1.505	0.30 ( 0.30)	0.99	10579.4	31400.00
5	28277.43	46.89	1.354	0.30 ( 0.30)	0.99	13755.9	40100.00
6	29732.48	56.21	1.240	0.30 ( 0.30)	0.99	17067.7	11801.00
7	31709.16	67.17	1.153	0.30 ( 0.30)	0.99	21647.4	11530.00
8	32762.81	71.61	1.122	0.30 ( 0.30)	0.99	23965.4	11701.00
9	33651.15	75.12	1.099	0.30 ( 0.30)	0.99	26034.4	11910.00
10	36314.48	85.50	1.028	0.30 ( 0.30)	0.99	32753.9	10800.00
11	37005.30	89.78	1.000	0.30 ( 0.30)	0.99	35696.6	11130.00
12	37047.93	99.36	0.957	0.30 ( 0.30)	0.99	40735.3	12410.00
13	36784.21	107.62	0.921	0.30 ( 0.30)	0.99	44477.5	11201.00
14	36505.89	112.55	0.900	0.30 ( 0.30)	0.99	46207.2	12201.00
15	35646.12	119.52	0.869	0.30 ( 0.30)	0.99	48062.5	12231.00
16	34504.94	127.22	0.852	0.30 ( 0.30)	0.99	49699.0	10400.00
17	33315.20	135.04	0.837	0.30 ( 0.30)	0.99	50993.5	12010.00
18	32260.23	140.90	0.825	0.30 ( 0.30)	0.99	51342.2	10210.00
19	31812.10	143.85	0.819	0.30 ( 0.30)	0.99	51457.7	12000.00
20	28660.98	168.66	0.769	0.30 ( 0.30)	0.99	52080.4	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12800.00 = 111795.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24248.13	25.94	1.889	0.30 ( 0.30)	0.99	6895.1	50120.00
2	24427.43	26.55	1.865	0.30 ( 0.30)	0.99	7041.8	40500.00
3	24661.79	27.19	1.840	0.30 ( 0.30)	0.99	7287.7	50150.00
4	25954.51	30.77	1.712	0.30 ( 0.30)	0.99	8649.0	50100.00
5	26046.59	31.02	1.705	0.30 ( 0.30)	0.99	8743.9	12710.00
6	26987.91	35.03	1.598	0.30 ( 0.30)	0.99	10257.4	31810.00
7	27685.05	38.55	1.505	0.30 ( 0.30)	0.99	11642.8	31400.00
8	29311.49	46.89	1.354	0.30 ( 0.30)	0.99	14819.2	40100.00
9	30655.05	56.21	1.240	0.30 ( 0.30)	0.99	18131.0	11801.00
10	32546.31	67.17	1.153	0.30 ( 0.30)	0.99	22710.8	11530.00
11	33570.59	71.61	1.122	0.30 ( 0.30)	0.99	25028.8	11701.00
12	34435.76	75.12	1.099	0.30 ( 0.30)	0.99	27097.8	11910.00
13	37030.62	85.50	1.028	0.30 ( 0.30)	0.99	33817.3	10800.00
14	37693.18	89.78	1.000	0.30 ( 0.30)	0.99	36760.0	11130.00
15	37694.45	99.36	0.957	0.30 ( 0.30)	0.99	41798.7	12410.00

16	37395.55	107.62	0.921	0.30 ( 0.30)	0.99	45540.9	11201.00
17	37096.21	112.55	0.900	0.30 ( 0.30)	0.99	47270.6	12201.00
18	36206.76	119.52	0.869	0.30 ( 0.30)	0.99	49125.9	12231.00
19	35049.32	127.22	0.852	0.30 ( 0.30)	0.99	50762.3	10400.00
20	33844.21	135.04	0.837	0.30 ( 0.30)	0.99	52056.9	12010.00
21	32777.70	140.90	0.825	0.30 ( 0.30)	0.99	52405.6	10210.00
22	32323.77	143.85	0.819	0.30 ( 0.30)	0.99	52521.0	12000.00
23	29123.84	168.66	0.769	0.30 ( 0.30)	0.99	53143.8	10100.00

TOTAL AREA (ACRES) = 53143.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 37694.45 Tc (MIN.) = 99.361  
EFFECTIVE AREA (ACRES) = 41798.73 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 53143.8  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12800.00 = 111795.71 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12800.00 TO NODE 12801.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 240.00 DOWNSTREAM (FEET) = 234.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1110.96 CHANNEL SLOPE = 0.0054  
GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 10.07  
CHANNEL FLOW THRU SUBAREA (CFS) = 37694.45  
FLOW VELOCITY (FEET/SEC.) = 14.96 FLOW DEPTH (FEET) = 10.07  
TRAVEL TIME (MIN.) = 1.24 Tc (MIN.) = 100.60  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12801.00 = 112906.67 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12801.00 TO NODE 12801.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*

FLOW PROCESS FROM NODE 12801.00 TO NODE 12801.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610502X.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	79.82	10.80	0.30 ( 0.28)	0.94	28.9	50200.00

TOTAL AREA (ACRES) = 28.9

\*\*\*\*\*

FLOW PROCESS FROM NODE 12801.00 TO NODE 12801.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24248.13	27.37	1.834	0.30 ( 0.30)	0.99	6895.1	50120.00
2	24427.43	27.98	1.810	0.30 ( 0.30)	0.99	7041.8	40500.00
3	24661.79	28.61	1.785	0.30 ( 0.30)	0.99	7287.7	50150.00
4	25954.51	32.17	1.674	0.30 ( 0.30)	0.99	8649.0	50100.00
5	26046.59	32.42	1.668	0.30 ( 0.30)	0.99	8743.9	12710.00
6	26987.91	36.41	1.561	0.30 ( 0.30)	0.99	10257.4	31810.00
7	27685.05	39.92	1.468	0.30 ( 0.30)	0.99	11642.8	31400.00
8	29311.49	48.24	1.333	0.30 ( 0.30)	0.99	14819.2	40100.00
9	30655.05	57.53	1.226	0.30 ( 0.30)	0.99	18131.0	11801.00
10	32546.31	68.46	1.144	0.30 ( 0.30)	0.99	22710.8	11530.00
11	33570.59	72.90	1.114	0.30 ( 0.30)	0.99	25028.8	11701.00
12	34435.76	76.40	1.090	0.30 ( 0.30)	0.99	27097.8	11910.00
13	37030.62	86.74	1.020	0.30 ( 0.30)	0.99	33817.3	10800.00
14	37693.18	91.01	0.994	0.30 ( 0.30)	0.99	36760.0	11130.00
15	37694.45	100.60	0.952	0.30 ( 0.30)	0.99	41798.7	12410.00
16	37395.55	108.86	0.916	0.30 ( 0.30)	0.99	45540.9	11201.00
17	37096.21	113.80	0.894	0.30 ( 0.30)	0.99	47270.6	12201.00
18	36206.76	120.77	0.865	0.30 ( 0.30)	0.99	49125.9	12231.00
19	35049.32	128.49	0.850	0.30 ( 0.30)	0.99	50762.3	10400.00
20	33844.21	136.32	0.834	0.30 ( 0.30)	0.99	52056.9	12010.00
21	32777.70	142.20	0.822	0.30 ( 0.30)	0.99	52405.6	10210.00
22	32323.77	145.15	0.816	0.30 ( 0.30)	0.99	52521.0	12000.00
23	29123.84	170.00	0.766	0.30 ( 0.30)	0.99	53143.8	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12801.00 = 112906.67 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	79.82	10.80	3.355	0.30 ( 0.28)	0.94	28.9	50200.00

LONGEST FLOWPATH FROM NODE 50200.00 TO NODE 12801.00 = 1426.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19112.31	10.80	3.355	0.30 ( 0.30)	0.99	2748.7	50200.00
2	24288.45	27.37	1.834	0.30 ( 0.30)	0.99	6924.0	50120.00
3	24467.14	27.98	1.810	0.30 ( 0.30)	0.99	7070.6	40500.00
4	24700.87	28.61	1.785	0.30 ( 0.30)	0.99	7316.6	50150.00
5	25990.69	32.17	1.674	0.30 ( 0.30)	0.99	8677.8	50100.00
6	26082.60	32.42	1.668	0.30 ( 0.30)	0.99	8772.8	12710.00
7	27021.17	36.41	1.561	0.30 ( 0.30)	0.99	10286.2	31810.00
8	27715.89	39.92	1.468	0.30 ( 0.30)	0.99	11671.7	31400.00
9	29338.80	48.24	1.333	0.30 ( 0.30)	0.99	14848.1	40100.00
10	30679.60	57.53	1.226	0.30 ( 0.30)	0.99	18159.9	11801.00
11	32568.72	68.46	1.144	0.30 ( 0.30)	0.99	22739.7	11530.00
12	33592.22	72.90	1.114	0.30 ( 0.30)	0.99	25057.6	11701.00
13	34456.77	76.40	1.090	0.30 ( 0.30)	0.99	27126.6	11910.00
14	37049.81	86.74	1.020	0.30 ( 0.30)	0.99	33846.1	10800.00
15	37711.69	91.01	0.994	0.30 ( 0.30)	0.99	36788.9	11130.00
16	37711.88	100.60	0.952	0.30 ( 0.30)	0.99	41827.6	12410.00
17	37412.03	108.86	0.916	0.30 ( 0.30)	0.99	45569.7	11201.00
18	37112.13	113.80	0.894	0.30 ( 0.30)	0.99	47299.4	12201.00
19	36221.94	120.77	0.865	0.30 ( 0.30)	0.99	49154.8	12231.00
20	35064.09	128.49	0.850	0.30 ( 0.30)	0.99	50791.2	10400.00
21	33858.57	136.32	0.834	0.30 ( 0.30)	0.99	52085.7	12010.00
22	32791.75	142.20	0.822	0.30 ( 0.30)	0.99	52434.4	10210.00

23	32337.67	145.15	0.816	0.30 ( 0.30)	0.99	52549.9	12000.00
24	29136.44	170.00	0.766	0.30 ( 0.30)	0.99	53172.6	10100.00

TOTAL AREA (ACRES) = 53172.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 37711.88 Tc (MIN.) = 100.599  
EFFECTIVE AREA (ACRES) = 41827.61 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 53172.6  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12801.00 = 112906.67 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12801.00 TO NODE 12901.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM (FEET) = 234.00 DOWNSTREAM (FEET) = 216.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2009.32 CHANNEL SLOPE = 0.0090  
GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 8.73  
CHANNEL FLOW THRU SUBAREA (CFS) = 37711.88  
FLOW VELOCITY (FEET/SEC.) = 17.74 FLOW DEPTH (FEET) = 8.73  
TRAVEL TIME (MIN.) = 1.89 Tc (MIN.) = 102.49  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<

PEAK FLOWRATE TABLE FILE NAME: 0610312X.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	499.11	30.27	0.30 ( 0.29)	0.96	385.8	31200.00

TOTAL AREA (ACRES) = 385.8

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19112.31	13.17	2.966	0.30 ( 0.30)	0.99	2748.7	50200.00
2	24288.45	29.56	1.749	0.30 ( 0.30)	0.99	6924.0	50120.00
3	24467.14	30.17	1.728	0.30 ( 0.30)	0.99	7070.6	40500.00
4	24700.87	30.79	1.711	0.30 ( 0.30)	0.99	7316.6	50150.00
5	25990.69	34.31	1.617	0.30 ( 0.30)	0.99	8677.8	50100.00
6	26082.60	34.56	1.611	0.30 ( 0.30)	0.99	8772.8	12710.00
7	27021.17	38.53	1.505	0.30 ( 0.30)	0.99	10286.2	31810.00
8	27715.89	42.01	1.433	0.30 ( 0.30)	0.99	11671.7	31400.00
9	29338.80	50.29	1.301	0.30 ( 0.30)	0.99	14848.1	40100.00
10	30679.60	59.55	1.206	0.30 ( 0.30)	0.99	18159.9	11801.00

11	32568.72	70.45	1.130	0.30 ( 0.30)	0.99	22739.7	11530.00
12	33592.22	74.86	1.100	0.30 ( 0.30)	0.99	25057.6	11701.00
13	34456.77	78.34	1.077	0.30 ( 0.30)	0.99	27126.6	11910.00
14	37049.81	88.64	1.007	0.30 ( 0.30)	0.99	33846.1	10800.00
15	37711.69	92.90	0.985	0.30 ( 0.30)	0.99	36788.9	11130.00
16	37711.88	102.49	0.943	0.30 ( 0.30)	0.99	41827.6	12410.00
17	37412.03	110.75	0.907	0.30 ( 0.30)	0.99	45569.7	11201.00
18	37112.13	115.70	0.886	0.30 ( 0.30)	0.99	47299.4	12201.00
19	36221.94	122.69	0.862	0.30 ( 0.30)	0.99	49154.8	12231.00
20	35064.09	130.43	0.846	0.30 ( 0.30)	0.99	50791.2	10400.00
21	33858.57	138.28	0.830	0.30 ( 0.30)	0.99	52085.7	12010.00
22	32791.75	144.18	0.818	0.30 ( 0.30)	0.99	52434.4	10210.00
23	32337.67	147.14	0.812	0.30 ( 0.30)	0.99	52549.9	12000.00
24	29136.44	172.06	0.762	0.30 ( 0.30)	0.99	53172.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	499.11	30.27	1.725	0.30 ( 0.29)	0.96	385.8	31200.00

LONGEST FLOWPATH FROM NODE 31200.00 TO NODE 12901.00 = 11169.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19516.92	13.17	2.966	0.30 ( 0.30)	0.99	2916.6	50200.00
2	24784.02	29.56	1.749	0.30 ( 0.30)	0.99	7300.7	50120.00
3	24965.46	30.17	1.728	0.30 ( 0.30)	0.99	7455.0	40500.00
4	25006.21	30.27	1.725	0.30 ( 0.30)	0.99	7498.5	31200.00
5	25195.18	30.79	1.711	0.30 ( 0.30)	0.99	7702.4	50150.00
6	26452.55	34.31	1.617	0.30 ( 0.30)	0.99	9063.6	50100.00
7	26542.14	34.56	1.611	0.30 ( 0.30)	0.99	9158.6	12710.00
8	27444.09	38.53	1.505	0.30 ( 0.30)	0.99	10672.0	31810.00
9	28113.91	42.01	1.433	0.30 ( 0.30)	0.99	12057.5	31400.00
10	29690.86	50.29	1.301	0.30 ( 0.30)	0.99	15233.9	40100.00
11	30998.55	59.55	1.206	0.30 ( 0.30)	0.99	18545.7	11801.00
12	32861.54	70.45	1.130	0.30 ( 0.30)	0.99	23125.5	11530.00
13	33874.67	74.86	1.100	0.30 ( 0.30)	0.99	25443.4	11701.00
14	34731.05	78.34	1.077	0.30 ( 0.30)	0.99	27512.4	11910.00
15	37299.91	88.64	1.007	0.30 ( 0.30)	0.99	34231.9	10800.00
16	37954.20	92.90	0.985	0.30 ( 0.30)	0.99	37174.6	11130.00
17	37939.86	102.49	0.943	0.30 ( 0.30)	0.99	42213.4	12410.00
18	37627.49	110.75	0.907	0.30 ( 0.30)	0.99	45955.5	11201.00
19	37320.10	115.70	0.886	0.30 ( 0.30)	0.99	47685.2	12201.00
20	36421.50	122.69	0.862	0.30 ( 0.30)	0.99	49540.6	12231.00
21	35258.24	130.43	0.846	0.30 ( 0.30)	0.99	51177.0	10400.00
22	34047.23	138.28	0.830	0.30 ( 0.30)	0.99	52471.5	12010.00
23	32976.28	144.18	0.818	0.30 ( 0.30)	0.99	52820.2	10210.00
24	32520.12	147.14	0.812	0.30 ( 0.30)	0.99	52935.7	12000.00
25	29301.45	172.06	0.762	0.30 ( 0.30)	0.99	53558.4	10100.00

TOTAL AREA (ACRES) = 53558.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 37954.20 Tc(MIN.) = 92.901  
EFFECTIVE AREA(ACRES) = 37174.62 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 53558.4  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

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*****
FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 12
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>>>>CLEAR MEMORY BANK # 3 <<<<<
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*****
FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 15.1
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>>>>DEFINE MEMORY BANK # 3 <<<<<
=====
PEAK FLOWRATE TABLE FILE NAME: 0610503X.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:
STREAM      Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS)    (MIN.) (INCH/HR)    (ACRES)  NODE
      1      562.80   23.65  0.30( 0.30) 0.99    366.1  50300.00
TOTAL AREA(ACRES) = 366.1
*****
FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 11
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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
=====
** MAIN STREAM CONFLUENCE DATA **
STREAM      Q      Tc      Intensity  Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS)    (MIN.) (INCH/HR) (INCH/HR)    (ACRES)  NODE
      1      19516.92  13.17   2.966  0.30( 0.30) 0.99    2916.6  50200.00
      2      24784.02  29.56   1.749  0.30( 0.30) 0.99    7300.7  50120.00
      3      24965.46  30.17   1.728  0.30( 0.30) 0.99    7455.0  40500.00
      4      25006.21  30.27   1.725  0.30( 0.30) 0.99    7498.5  31200.00
      5      25195.18  30.79   1.711  0.30( 0.30) 0.99    7702.4  50150.00
      6      26452.55  34.31   1.617  0.30( 0.30) 0.99    9063.6  50100.00
      7      26542.14  34.56   1.611  0.30( 0.30) 0.99    9158.6  12710.00
      8      27444.09  38.53   1.505  0.30( 0.30) 0.99   10672.0  31810.00
      9      28113.91  42.01   1.433  0.30( 0.30) 0.99   12057.5  31400.00
     10      29690.86  50.29   1.301  0.30( 0.30) 0.99   15233.9  40100.00
     11      30998.55  59.55   1.206  0.30( 0.30) 0.99   18545.7  11801.00
     12      32861.54  70.45   1.130  0.30( 0.30) 0.99   23125.5  11530.00
     13      33874.67  74.86   1.100  0.30( 0.30) 0.99   25443.4  11701.00
     14      34731.05  78.34   1.077  0.30( 0.30) 0.99   27512.4  11910.00
     15      37299.91  88.64   1.007  0.30( 0.30) 0.99   34231.9  10800.00
     16      37954.20  92.90   0.985  0.30( 0.30) 0.99   37174.6  11130.00
     17      37939.86  102.49  0.943  0.30( 0.30) 0.99   42213.4  12410.00
     18      37627.49  110.75  0.907  0.30( 0.30) 0.99   45955.5  11201.00
     19      37320.10  115.70  0.886  0.30( 0.30) 0.99   47685.2  12201.00
     20      36421.50  122.69  0.862  0.30( 0.30) 0.99   49540.6  12231.00
     21      35258.24  130.43  0.846  0.30( 0.30) 0.99   51177.0  10400.00
     22      34047.23  138.28  0.830  0.30( 0.30) 0.99   52471.5  12010.00
     23      32976.28  144.18  0.818  0.30( 0.30) 0.99   52820.2  10210.00
     24      32520.12  147.14  0.812  0.30( 0.30) 0.99   52935.7  12000.00
     25      29301.45  172.06  0.762  0.30( 0.30) 0.99   53558.4  10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.
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\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	499.11	30.27	1.725	0.30 ( 0.29)	0.96	385.8	31200.00

1 562.80 23.65 2.006 0.30( 0.30) 0.99 366.1 50300.00  
LONGEST FLOWPATH FROM NODE 50300.00 TO NODE 12901.00 = 8614.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20006.35	13.17	2.966	0.30( 0.30)	0.99	3120.5	50200.00
2	23449.19	23.65	2.006	0.30( 0.30)	0.99	6087.3	50300.00
3	25262.10	29.56	1.749	0.30( 0.30)	0.99	7666.8	50120.00
4	25436.49	30.17	1.728	0.30( 0.30)	0.99	7821.2	40500.00
5	25476.30	30.27	1.725	0.30( 0.30)	0.99	7864.6	31200.00
6	25660.72	30.79	1.711	0.30( 0.30)	0.99	8068.5	50150.00
7	26887.28	34.31	1.617	0.30( 0.30)	0.99	9429.7	50100.00
8	26974.68	34.56	1.611	0.30( 0.30)	0.99	9524.7	12710.00
9	27841.87	38.53	1.505	0.30( 0.30)	0.99	11038.1	31810.00
10	28488.06	42.01	1.433	0.30( 0.30)	0.99	12423.6	31400.00
11	30021.37	50.29	1.301	0.30( 0.30)	0.99	15600.0	40100.00
12	31297.64	59.55	1.206	0.30( 0.30)	0.99	18911.8	11801.00
13	33135.82	70.45	1.130	0.30( 0.30)	0.99	23491.6	11530.00
14	34139.11	74.86	1.100	0.30( 0.30)	0.99	25809.5	11701.00
15	34987.73	78.34	1.077	0.30( 0.30)	0.99	27878.5	11910.00
16	37533.65	88.64	1.007	0.30( 0.30)	0.99	34598.0	10800.00
17	38180.73	92.90	0.985	0.30( 0.30)	0.99	37540.7	11130.00
18	38152.61	102.49	0.943	0.30( 0.30)	0.99	42579.5	12410.00
19	37828.35	110.75	0.907	0.30( 0.30)	0.99	46321.6	11201.00
20	37513.85	115.70	0.886	0.30( 0.30)	0.99	48051.3	12201.00
21	36607.28	122.69	0.862	0.30( 0.30)	0.99	49906.7	12231.00
22	35438.88	130.43	0.846	0.30( 0.30)	0.99	51543.1	10400.00
23	34222.65	138.28	0.830	0.30( 0.30)	0.99	52837.6	12010.00
24	33147.79	144.18	0.818	0.30( 0.30)	0.99	53186.3	10210.00
25	32689.65	147.14	0.812	0.30( 0.30)	0.99	53301.8	12000.00
26	29454.43	172.06	0.762	0.30( 0.30)	0.99	53924.5	10100.00

TOTAL AREA (ACRES) = 53924.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 38180.73 Tc(MIN.) = 92.901  
EFFECTIVE AREA(ACRES) = 37540.74 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 53924.5  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12901.00 TO NODE 12902.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 216.00 DOWNSTREAM(FEET) = 215.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 122.04 CHANNEL SLOPE = 0.0082  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 9.01  
CHANNEL FLOW THRU SUBAREA(CFS) = 38180.73  
FLOW VELOCITY(FEET/SEC.) = 17.29 FLOW DEPTH(FEET) = 9.01  
TRAVEL TIME(MIN.) = 0.12 Tc(MIN.) = 93.02  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12902.00 = 115038.03 FEET.

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FLOW PROCESS FROM NODE 12902.00 TO NODE 12902.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 1 <<<<<

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FLOW PROCESS FROM NODE 12902.00 TO NODE 12903.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 215.00 DOWNSTREAM(FEET) = 214.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 895.53 CHANNEL SLOPE = 0.0011  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 15.69  
CHANNEL FLOW THRU SUBAREA(CFS) = 38180.73  
FLOW VELOCITY(FEET/SEC.) = 8.74 FLOW DEPTH(FEET) = 15.69  
TRAVEL TIME(MIN.) = 1.71 Tc(MIN.) = 94.73  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

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FLOW PROCESS FROM NODE 12902.00 TO NODE 12903.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 2 <<<<<

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FLOW PROCESS FROM NODE 12903.00 TO NODE 12903.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 2 <<<<<

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PEAK FLOWRATE TABLE FILE NAME: 0610504X.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	142.31	16.55	0.30( 0.29)	0.97	70.7	50400.00

TOTAL AREA(ACRES) = 70.7

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FLOW PROCESS FROM NODE 12903.00 TO NODE 12903.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20006.35	15.41	2.631	0.30( 0.30)	0.99	3120.5	50200.00
2	23449.19	25.78	1.895	0.30( 0.30)	0.99	6087.3	50300.00
3	25262.10	31.63	1.689	0.30( 0.30)	0.99	7666.8	50120.00
4	25436.49	32.24	1.673	0.30( 0.30)	0.99	7821.2	40500.00
5	25476.30	32.34	1.670	0.30( 0.30)	0.99	7864.6	31200.00
6	25660.72	32.86	1.656	0.30( 0.30)	0.99	8068.5	50150.00
7	26887.28	36.34	1.563	0.30( 0.30)	0.99	9429.7	50100.00
8	26974.68	36.59	1.557	0.30( 0.30)	0.99	9524.7	12710.00
9	27841.87	40.54	1.457	0.30( 0.30)	0.99	11038.1	31810.00
10	28488.06	44.01	1.401	0.30( 0.30)	0.99	12423.6	31400.00

11	30021.37	52.26	1.281	0.30	( 0.30)	0.99	15600.0	40100.00
12	31297.64	61.49	1.191	0.30	( 0.30)	0.99	18911.8	11801.00
13	33135.82	72.35	1.117	0.30	( 0.30)	0.99	23491.6	11530.00
14	34139.11	76.75	1.088	0.30	( 0.30)	0.99	25809.5	11701.00
15	34987.73	80.22	1.064	0.30	( 0.30)	0.99	27878.5	11910.00
16	37533.65	90.48	0.996	0.30	( 0.30)	0.99	34598.0	10800.00
17	38180.73	94.73	0.977	0.30	( 0.30)	0.99	37540.7	11130.00
18	38152.61	104.31	0.936	0.30	( 0.30)	0.99	42579.5	12410.00
19	37828.35	112.58	0.899	0.30	( 0.30)	0.99	46321.6	11201.00
20	37513.85	117.53	0.878	0.30	( 0.30)	0.99	48051.3	12201.00
21	36607.28	124.54	0.858	0.30	( 0.30)	0.99	49906.7	12231.00
22	35438.88	132.29	0.842	0.30	( 0.30)	0.99	51543.1	10400.00
23	34222.65	140.16	0.826	0.30	( 0.30)	0.99	52837.6	12010.00
24	33147.79	146.08	0.814	0.30	( 0.30)	0.99	53186.3	10210.00
25	32689.65	149.05	0.808	0.30	( 0.30)	0.99	53301.8	12000.00
26	29454.43	174.04	0.758	0.30	( 0.30)	0.99	53924.5	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	142.31	16.55	2.530	0.30	( 0.29)	0.97	70.7 50400.00

LONGEST FLOWPATH FROM NODE 50400.00 TO NODE 12903.00 = 3607.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20144.79	15.41	2.631	0.30	( 0.30)	0.99	3186.3 50200.00
2	20528.57	16.55	2.530	0.30	( 0.30)	0.99	3518.5 50400.00
3	23551.09	25.78	1.895	0.30	( 0.30)	0.99	6158.0 50300.00
4	25350.88	31.63	1.689	0.30	( 0.30)	0.99	7737.4 50120.00
5	25524.25	32.24	1.673	0.30	( 0.30)	0.99	7891.8 40500.00
6	25563.88	32.34	1.670	0.30	( 0.30)	0.99	7935.3 31200.00
7	25747.44	32.86	1.656	0.30	( 0.30)	0.99	8139.2 50150.00
8	26968.10	36.34	1.563	0.30	( 0.30)	0.99	9500.4 50100.00
9	27055.07	36.59	1.557	0.30	( 0.30)	0.99	9595.4 12710.00
10	27915.94	40.54	1.457	0.30	( 0.30)	0.99	11108.8 31810.00
11	28558.56	44.01	1.401	0.30	( 0.30)	0.99	12494.3 31400.00
12	30084.22	52.26	1.281	0.30	( 0.30)	0.99	15670.7 40100.00
13	31354.78	61.49	1.191	0.30	( 0.30)	0.99	18982.5 11801.00
14	33188.29	72.35	1.117	0.30	( 0.30)	0.99	23562.3 11530.00
15	34189.69	76.75	1.088	0.30	( 0.30)	0.99	25880.2 11701.00
16	35036.82	80.22	1.064	0.30	( 0.30)	0.99	27949.2 11910.00
17	37578.39	90.48	0.996	0.30	( 0.30)	0.99	34668.7 10800.00
18	38224.29	94.73	0.977	0.30	( 0.30)	0.99	37611.4 11130.00
19	38193.51	104.31	0.936	0.30	( 0.30)	0.99	42650.2 12410.00
20	37866.95	112.58	0.899	0.30	( 0.30)	0.99	46392.3 11201.00
21	37551.07	117.53	0.878	0.30	( 0.30)	0.99	48122.0 12201.00
22	36643.24	124.54	0.858	0.30	( 0.30)	0.99	49977.4 12231.00
23	35473.84	132.29	0.842	0.30	( 0.30)	0.99	51613.8 10400.00
24	34256.61	140.16	0.826	0.30	( 0.30)	0.99	52908.3 12010.00
25	33180.98	146.08	0.814	0.30	( 0.30)	0.99	53257.0 10210.00
26	32722.47	149.05	0.808	0.30	( 0.30)	0.99	53372.5 12000.00
27	29484.05	174.04	0.758	0.30	( 0.30)	0.99	53995.2 10100.00

TOTAL AREA (ACRES) = 53995.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 38224.29 Tc (MIN.) = 94.727

EFFECTIVE AREA (ACRES) = 37611.42 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 53995.2  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

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FLOW PROCESS FROM NODE 12903.00 TO NODE 12904.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM (FEET) = 214.00 DOWNSTREAM (FEET) = 213.00

CHANNEL LENGTH THRU SUBAREA (FEET) = 767.57 CHANNEL SLOPE = 0.0013

GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT (FEET) = 15.05

CHANNEL FLOW THRU SUBAREA (CFS) = 38224.29

FLOW VELOCITY (FEET/SEC.) = 9.23 FLOW DEPTH (FEET) = 15.05

TRAVEL TIME (MIN.) = 1.39 Tc (MIN.) = 96.11

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12904.00 = 116701.13 FEET.

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FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 3 <<<<

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FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<

PEAK FLOWRATE TABLE FILE NAME: 0610311X.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	158.76	27.53	0.30	( 0.29)	0.97	114.8	31100.00

TOTAL AREA (ACRES) = 114.8

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FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20144.79	17.10	2.482	0.30	( 0.30)	0.99	3186.3 50200.00
2	20528.57	18.24	2.382	0.30	( 0.30)	0.99	3518.5 50400.00
3	23551.09	27.39	1.833	0.30	( 0.30)	0.99	6158.0 50300.00
4	25350.88	33.21	1.647	0.30	( 0.30)	0.99	7737.4 50120.00
5	25524.25	33.81	1.631	0.30	( 0.30)	0.99	7891.8 40500.00
6	25563.88	33.91	1.628	0.30	( 0.30)	0.99	7935.3 31200.00
7	25747.44	34.42	1.614	0.30	( 0.30)	0.99	8139.2 50150.00
8	26968.10	37.89	1.522	0.30	( 0.30)	0.99	9500.4 50100.00
9	27055.07	38.13	1.516	0.30	( 0.30)	0.99	9595.4 12710.00
10	27915.94	42.07	1.433	0.30	( 0.30)	0.99	11108.8 31810.00

11	28558.56	45.52	1.377	0.30 ( 0.30)	0.99	12494.3	31400.00
12	30084.22	53.75	1.265	0.30 ( 0.30)	0.99	15670.7	40100.00
13	31354.78	62.97	1.181	0.30 ( 0.30)	0.99	18982.5	11801.00
14	33188.29	73.80	1.108	0.30 ( 0.30)	0.99	23562.3	11530.00
15	34189.69	78.19	1.078	0.30 ( 0.30)	0.99	25880.2	11701.00
16	35036.82	81.64	1.055	0.30 ( 0.30)	0.99	27949.2	11910.00
17	37578.39	91.87	0.990	0.30 ( 0.30)	0.99	34668.7	10800.00
18	38224.29	96.11	0.971	0.30 ( 0.30)	0.99	37611.4	11130.00
19	38193.51	105.70	0.929	0.30 ( 0.30)	0.99	42650.2	12410.00
20	37866.95	113.97	0.893	0.30 ( 0.30)	0.99	46392.3	11201.00
21	37551.07	118.93	0.872	0.30 ( 0.30)	0.99	48122.0	12201.00
22	36643.24	125.94	0.855	0.30 ( 0.30)	0.99	49977.4	12231.00
23	35473.84	133.71	0.839	0.30 ( 0.30)	0.99	51613.8	10400.00
24	34256.61	141.60	0.823	0.30 ( 0.30)	0.99	52908.3	12010.00
25	33180.98	147.53	0.811	0.30 ( 0.30)	0.99	53257.0	10210.00
26	32722.47	150.51	0.805	0.30 ( 0.30)	0.99	53372.5	12000.00
27	29484.05	175.54	0.755	0.30 ( 0.30)	0.99	53995.2	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12904.00 = 116701.13 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	158.76	27.53	1.827	0.30 ( 0.29)	0.97	114.8	31100.00

LONGEST FLOWPATH FROM NODE 31100.00 TO NODE 12904.00 = 6503.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20285.43	17.10	2.482	0.30 ( 0.30)	0.99	3257.6	50200.00
2	20671.71	18.24	2.382	0.30 ( 0.30)	0.99	3594.6	50400.00
3	23709.61	27.39	1.833	0.30 ( 0.30)	0.99	6272.2	50300.00
4	23751.62	27.53	1.827	0.30 ( 0.30)	0.99	6309.4	31100.00
5	25490.97	33.21	1.647	0.30 ( 0.30)	0.99	7852.3	50120.00
6	25662.69	33.81	1.631	0.30 ( 0.30)	0.99	8006.6	40500.00
7	25702.04	33.91	1.628	0.30 ( 0.30)	0.99	8050.1	31200.00
8	25884.18	34.42	1.614	0.30 ( 0.30)	0.99	8254.0	50150.00
9	27095.34	37.89	1.522	0.30 ( 0.30)	0.99	9615.2	50100.00
10	27181.63	38.13	1.516	0.30 ( 0.30)	0.99	9710.2	12710.00
11	28033.92	42.07	1.433	0.30 ( 0.30)	0.99	11223.6	31810.00
12	28670.75	45.52	1.377	0.30 ( 0.30)	0.99	12609.1	31400.00
13	30184.93	53.75	1.265	0.30 ( 0.30)	0.99	15785.5	40100.00
14	31446.76	62.97	1.181	0.30 ( 0.30)	0.99	19097.3	11801.00
15	33272.70	73.80	1.108	0.30 ( 0.30)	0.99	23677.1	11530.00
16	34271.04	78.19	1.078	0.30 ( 0.30)	0.99	25995.0	11701.00
17	35115.75	81.64	1.055	0.30 ( 0.30)	0.99	28064.0	11910.00
18	37650.64	91.87	0.990	0.30 ( 0.30)	0.99	34783.5	10800.00
19	38294.63	96.11	0.971	0.30 ( 0.30)	0.99	37726.2	11130.00
20	38259.52	105.70	0.929	0.30 ( 0.30)	0.99	42765.0	12410.00
21	37929.23	113.97	0.893	0.30 ( 0.30)	0.99	46507.1	11201.00
22	37611.12	118.93	0.872	0.30 ( 0.30)	0.99	48236.8	12201.00
23	36701.56	125.94	0.855	0.30 ( 0.30)	0.99	50092.2	12231.00
24	35530.55	133.71	0.839	0.30 ( 0.30)	0.99	51728.6	10400.00
25	34311.67	141.60	0.823	0.30 ( 0.30)	0.99	53023.1	12010.00
26	33234.81	147.53	0.811	0.30 ( 0.30)	0.99	53371.8	10210.00
27	32775.68	150.51	0.805	0.30 ( 0.30)	0.99	53487.3	12000.00
28	29532.04	175.54	0.755	0.30 ( 0.30)	0.99	54110.0	10100.00

TOTAL AREA (ACRES) = 54110.0

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 38294.63 Tc(MIN.) = 96.113  
 EFFECTIVE AREA(ACRES) = 37726.23 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 54110.0  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12904.00 = 116701.13 FEET.

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 54110.0 TC(MIN.) = 96.11  
 EFFECTIVE AREA(ACRES) = 37726.23 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.993  
 PEAK FLOW RATE(CFS) = 38294.63

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20285.43	17.10	2.482	0.30 ( 0.30)	0.99	3257.6	50200.00
2	20671.71	18.24	2.382	0.30 ( 0.30)	0.99	3594.6	50400.00
3	23709.61	27.39	1.833	0.30 ( 0.30)	0.99	6272.2	50300.00
4	23751.62	27.53	1.827	0.30 ( 0.30)	0.99	6309.4	31100.00
5	25490.97	33.21	1.647	0.30 ( 0.30)	0.99	7852.3	50120.00
6	25662.69	33.81	1.631	0.30 ( 0.30)	0.99	8006.6	40500.00
7	25702.04	33.91	1.628	0.30 ( 0.30)	0.99	8050.1	31200.00
8	25884.18	34.42	1.614	0.30 ( 0.30)	0.99	8254.0	50150.00
9	27095.34	37.89	1.522	0.30 ( 0.30)	0.99	9615.2	50100.00
10	27181.63	38.13	1.516	0.30 ( 0.30)	0.99	9710.2	12710.00
11	28033.92	42.07	1.433	0.30 ( 0.30)	0.99	11223.6	31810.00
12	28670.75	45.52	1.377	0.30 ( 0.30)	0.99	12609.1	31400.00
13	30184.93	53.75	1.265	0.30 ( 0.30)	0.99	15785.5	40100.00
14	31446.76	62.97	1.181	0.30 ( 0.30)	0.99	19097.3	11801.00
15	33272.70	73.80	1.108	0.30 ( 0.30)	0.99	23677.1	11530.00
16	34271.04	78.19	1.078	0.30 ( 0.30)	0.99	25995.0	11701.00
17	35115.75	81.64	1.055	0.30 ( 0.30)	0.99	28064.0	11910.00
18	37650.64	91.87	0.990	0.30 ( 0.30)	0.99	34783.5	10800.00
19	38294.63	96.11	0.971	0.30 ( 0.30)	0.99	37726.2	11130.00
20	38259.52	105.70	0.929	0.30 ( 0.30)	0.99	42765.0	12410.00
21	37929.23	113.97	0.893	0.30 ( 0.30)	0.99	46507.1	11201.00
22	37611.12	118.93	0.872	0.30 ( 0.30)	0.99	48236.8	12201.00
23	36701.56	125.94	0.855	0.30 ( 0.30)	0.99	50092.2	12231.00
24	35530.55	133.71	0.839	0.30 ( 0.30)	0.99	51728.6	10400.00
25	34311.67	141.60	0.823	0.30 ( 0.30)	0.99	53023.1	12010.00
26	33234.81	147.53	0.811	0.30 ( 0.30)	0.99	53371.8	10210.00
27	32775.68	150.51	0.805	0.30 ( 0.30)	0.99	53487.3	12000.00
28	29532.04	175.54	0.755	0.30 ( 0.30)	0.99	54110.0	10100.00

END OF RATIONAL METHOD ANALYSIS



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

Analysis prepared by:

\*\*\*\*\* DESCRIPTION OF STUDY \*\*\*\*\*  
\* \* \* \* \*

FILE NAME: S30.DAT  
TIME/DATE OF STUDY: 11:59 04/03/2013

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 4.440
- 2) 10.00; 3.011
- 3) 15.00; 2.390
- 4) 20.00; 2.029
- 5) 25.00; 1.787
- 6) 30.00; 1.600
- 7) 40.00; 1.368
- 8) 50.00; 1.205
- 9) 60.00; 1.060
- 10) 90.00; 0.862
- 11) 120.00; 0.732
- 12) 180.00; 0.593
- 13) 360.00; 0.412
- 14) 1440.00; 0.172

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	HALF- WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- SIDE / SIDE/ WAY	STREET-CROSSFALL: HEIGHT (FT)	CURB WIDTH (FT)	GUTTER-GEOMETRIES: LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:  
1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)

2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)  
\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13000.00 TO NODE 13001.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 279.24  
ELEVATION DATA: UPSTREAM(FEET) = 1187.54 DOWNSTREAM(FEET) = 1104.45

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.560  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.423  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "OPEN BRUSH"	-	0.65	0.30	1.000	0	8.56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 1.83  
TOTAL AREA(ACRES) = 0.65 PEAK FLOW RATE(CFS) = 1.83

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13001.00 TO NODE 13002.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1104.45 DOWNSTREAM(FEET) = 1034.82  
CHANNEL LENGTH THRU SUBAREA(FEET) = 736.73 CHANNEL SLOPE = 0.0945  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.37  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.975  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	19.74	0.30	0.968	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.968  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25.76  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.08  
AVERAGE FLOW DEPTH(FEET) = 0.34 TRAVEL TIME(MIN.) = 1.73  
Tc(MIN.) = 10.29  
SUBAREA AREA(ACRES) = 19.74 SUBAREA RUNOFF(CFS) = 47.69  
EFFECTIVE AREA(ACRES) = 20.39 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA(ACRES) = 20.4 PEAK FLOW RATE(CFS) = 49.25  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.50

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.50 FLOW VELOCITY(FEET/SEC.) = 8.94  
LONGEST FLOWPATH FROM NODE 13000.00 TO NODE 13002.00 = 1015.97 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13002.00 TO NODE 13003.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1034.82 DOWNSTREAM(FEET) = 986.71  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1305.95 CHANNEL SLOPE = 0.0368  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.26

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.686

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	83.90	0.30	0.904	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.904

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 140.67

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.36

AVERAGE FLOW DEPTH(FEET) = 1.21 TRAVEL TIME(MIN.) = 2.33

Tc(MIN.) = 12.62

SUBAREA AREA(ACRES) = 83.90 SUBAREA RUNOFF(CFS) = 182.32

EFFECTIVE AREA(ACRES) = 104.29 AREA-AVERAGED Fm(INCH/HR) = 0.27

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.92

TOTAL AREA(ACRES) = 104.3 PEAK FLOW RATE(CFS) = 226.27

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.58

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.58 FLOW VELOCITY(FEET/SEC.) = 10.86

LONGEST FLOWPATH FROM NODE 13000.00 TO NODE 13003.00 = 2321.92 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13003.00 TO NODE 13004.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 986.71 DOWNSTREAM(FEET) = 939.06  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1318.54 CHANNEL SLOPE = 0.0361  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.78

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.446

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	47.44	0.30	0.871	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.871

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 272.95

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.41

AVERAGE FLOW DEPTH(FEET) = 1.77 TRAVEL TIME(MIN.) = 1.93

Tc(MIN.) = 14.55  
SUBAREA AREA(ACRES) = 47.44 SUBAREA RUNOFF(CFS) = 93.30  
EFFECTIVE AREA(ACRES) = 151.73 AREA-AVERAGED Fm(INCH/HR) = 0.27  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.90  
TOTAL AREA(ACRES) = 151.7 PEAK FLOW RATE(CFS) = 297.12  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.85

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.85 FLOW VELOCITY(FEET/SEC.) = 11.71

LONGEST FLOWPATH FROM NODE 13000.00 TO NODE 13004.00 = 3640.46 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13004.00 TO NODE 13020.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 939.06 DOWNSTREAM(FEET) = 861.53  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1954.61 CHANNEL SLOPE = 0.0397  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.05

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.240

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	77.87	0.30	0.856	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.856

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 366.66

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.89

AVERAGE FLOW DEPTH(FEET) = 2.02 TRAVEL TIME(MIN.) = 2.53

Tc(MIN.) = 17.07

SUBAREA AREA(ACRES) = 77.87 SUBAREA RUNOFF(CFS) = 139.02

EFFECTIVE AREA(ACRES) = 229.60 AREA-AVERAGED Fm(INCH/HR) = 0.27

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.89

TOTAL AREA(ACRES) = 229.6 PEAK FLOW RATE(CFS) = 408.00

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.15

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.15 FLOW VELOCITY(FEET/SEC.) = 13.30

LONGEST FLOWPATH FROM NODE 13000.00 TO NODE 13020.00 = 5595.07 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13004.00 TO NODE 13020.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 17.07

RAINFALL INTENSITY(INCH/HR) = 2.24

AREA-AVERAGED Fm(INCH/HR) = 0.27

AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.89  
EFFECTIVE STREAM AREA (ACRES) = 229.60  
TOTAL STREAM AREA (ACRES) = 229.60  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 408.00

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13010.00 TO NODE 13011.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH (FEET) = 284.64  
ELEVATION DATA: UPSTREAM (FEET) = 1190.91 DOWNSTREAM (FEET) = 1110.50

Tc = K \* [(LENGTH\*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20  
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 8.716  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 3.378  
SUBAREA Tc AND LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"OPEN BRUSH" - 0.91 0.30 1.000 0 8.72  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF (CFS) = 2.52  
TOTAL AREA (ACRES) = 0.91 PEAK FLOW RATE (CFS) = 2.52

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13011.00 TO NODE 13012.00 IS CODE = 62  
-----

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<  
>>>>(STREET TABLE SECTION # 1 USED)<<<<<  
=====

UPSTREAM ELEVATION (FEET) = 1110.50 DOWNSTREAM ELEVATION (FEET) = 1068.16  
STREET LENGTH (FEET) = 581.12 CURB HEIGHT (INCHES) = 8.0  
STREET HALFWIDTH (FEET) = 30.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00  
INSIDE STREET CROSSFALL (DECIMAL) = 0.018  
OUTSIDE STREET CROSSFALL (DECIMAL) = 0.018

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2  
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020  
Manning's FRICTION FACTOR for Streetflow Section (curb-to-curb) = 0.0150  
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

\*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 15.14  
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  
STREET FLOW DEPTH (FEET) = 0.35  
HALFSTREET FLOOD WIDTH (FEET) = 10.74  
AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.18  
PRODUCT OF DEPTH&VELOCITY (FT\*FT/SEC.) = 2.19  
STREET FLOW TRAVEL TIME (MIN.) = 1.57 Tc (MIN.) = 10.28  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.976

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 10.46 0.30 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA AREA (ACRES) = 10.46 SUBAREA RUNOFF (CFS) = 25.19  
EFFECTIVE AREA (ACRES) = 11.37 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 11.4 PEAK FLOW RATE (CFS) = 27.38

END OF SUBAREA STREET FLOW HYDRAULICS:  
DEPTH (FEET) = 0.41 HALFSTREET FLOOD WIDTH (FEET) = 14.02  
FLOW VELOCITY (FEET/SEC.) = 7.02 DEPTH\*VELOCITY (FT\*FT/SEC.) = 2.90  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13012.00 = 865.76 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13012.00 TO NODE 13013.00 IS CODE = 62  
-----

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<  
>>>>(STREET TABLE SECTION # 1 USED)<<<<<  
=====

UPSTREAM ELEVATION (FEET) = 1068.16 DOWNSTREAM ELEVATION (FEET) = 994.58  
STREET LENGTH (FEET) = 1505.98 CURB HEIGHT (INCHES) = 8.0  
STREET HALFWIDTH (FEET) = 30.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00  
INSIDE STREET CROSSFALL (DECIMAL) = 0.018  
OUTSIDE STREET CROSSFALL (DECIMAL) = 0.018

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2  
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020  
Manning's FRICTION FACTOR for Streetflow Section (curb-to-curb) = 0.0150  
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

\*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 64.01  
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  
STREET FLOW DEPTH (FEET) = 0.55  
HALFSTREET FLOOD WIDTH (FEET) = 21.52  
AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.39  
PRODUCT OF DEPTH&VELOCITY (FT\*FT/SEC.) = 4.04  
STREET FLOW TRAVEL TIME (MIN.) = 3.40 Tc (MIN.) = 13.68  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.554

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 35.49 0.30 0.901 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.901  
SUBAREA AREA (ACRES) = 35.49 SUBAREA RUNOFF (CFS) = 72.95  
EFFECTIVE AREA (ACRES) = 46.86 AREA-AVERAGED Fm (INCH/HR) = 0.28  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.93  
TOTAL AREA (ACRES) = 46.9 PEAK FLOW RATE (CFS) = 96.01

END OF SUBAREA STREET FLOW HYDRAULICS:  
DEPTH (FEET) = 0.61 HALFSTREET FLOOD WIDTH (FEET) = 25.27  
FLOW VELOCITY (FEET/SEC.) = 8.14 DEPTH\*VELOCITY (FT\*FT/SEC.) = 5.00  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13013.00 = 2371.74 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13013.00 TO NODE 13014.00 IS CODE = 56  
-----

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 994.58 DOWNSTREAM(FEET) = 944.96
CHANNEL LENGTH THRU SUBAREA(FEET) = 1798.86 CHANNEL SLOPE = 0.0276
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.47
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.242
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 73.31 0.30 0.616 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.616
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 163.99
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.91
AVERAGE FLOW DEPTH(FEET) = 1.43 TRAVEL TIME(MIN.) = 3.37
Tc(MIN.) = 17.05
SUBAREA AREA(ACRES) = 73.31 SUBAREA RUNOFF(CFS) = 135.75
EFFECTIVE AREA(ACRES) = 120.17 AREA-AVERAGED Fm(INCH/HR) = 0.22
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.74
TOTAL AREA(ACRES) = 120.2 PEAK FLOW RATE(CFS) = 218.62
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.68

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.68 FLOW VELOCITY(FEET/SEC.) = 9.72
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13014.00 = 4170.60 FEET.

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*****
FLOW PROCESS FROM NODE 13014.00 TO NODE 13020.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 944.96 DOWNSTREAM(FEET) = 861.53
CHANNEL LENGTH THRU SUBAREA(FEET) = 1519.40 CHANNEL SLOPE = 0.0549
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.63
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.106
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 80.22 0.30 0.810 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.810
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 285.90
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.39
AVERAGE FLOW DEPTH(FEET) = 1.61 TRAVEL TIME(MIN.) = 1.89
Tc(MIN.) = 18.94
SUBAREA AREA(ACRES) = 80.22 SUBAREA RUNOFF(CFS) = 134.49
EFFECTIVE AREA(ACRES) = 200.39 AREA-AVERAGED Fm(INCH/HR) = 0.23
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.77
TOTAL AREA(ACRES) = 200.4 PEAK FLOW RATE(CFS) = 338.34
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

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"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.77

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.77 FLOW VELOCITY(FEET/SEC.) = 14.09
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13020.00 = 5690.00 FEET.

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*****
FLOW PROCESS FROM NODE 13014.00 TO NODE 13020.00 IS CODE = 1
=====

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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 18.94
RAINFALL INTENSITY(INCH/HR) = 2.11
AREA-AVERAGED Fm(INCH/HR) = 0.23
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.77
EFFECTIVE STREAM AREA(ACRES) = 200.39
TOTAL STREAM AREA(ACRES) = 200.39
PEAK FLOW RATE(CFS) AT CONFLUENCE = 338.34

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```

** CONFLUENCE DATA **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 408.00 17.07 2.240 0.30( 0.27) 0.89 229.6 13000.00
2 338.34 18.94 2.106 0.30( 0.23) 0.77 200.4 13010.00

```

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

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** PEAK FLOW RATE TABLE **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 734.90 17.07 2.240 0.30( 0.25) 0.83 410.3 13000.00
2 718.51 18.94 2.106 0.30( 0.25) 0.83 430.0 13010.00

```

```

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 734.90 Tc(MIN.) = 17.07
EFFECTIVE AREA(ACRES) = 410.25 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83
TOTAL AREA(ACRES) = 430.0
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13020.00 = 5690.00 FEET.

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*****
FLOW PROCESS FROM NODE 13020.00 TO NODE 13021.00 IS CODE = 56
=====

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```

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 861.53 DOWNSTREAM(FEET) = 843.84
CHANNEL LENGTH THRU SUBAREA(FEET) = 1274.71 CHANNEL SLOPE = 0.0139
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.80
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.050

```

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	80.78	0.30	0.818	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.818  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 800.52  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.05  
AVERAGE FLOW DEPTH(FEET) = 1.80 TRAVEL TIME(MIN.) = 2.64  
Tc(MIN.) = 19.71  
SUBAREA AREA(ACRES) = 80.78 SUBAREA RUNOFF(CFS) = 131.19  
EFFECTIVE AREA(ACRES) = 491.03 AREA-AVERAGED Fm(INCH/HR) = 0.25  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83  
TOTAL AREA(ACRES) = 510.8 PEAK FLOW RATE(CFS) = 795.72  
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.79

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.79 FLOW VELOCITY(FEET/SEC.) = 8.04  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13021.00 = 6964.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap (DECIMAL)	Ae (ACRES)	HEADWATER NODE
1	795.72	19.71	2.050	0.30( 0.25)	0.83	491.0	13000.00
2	782.95	21.60	1.952	0.30( 0.25)	0.83	510.8	13010.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 795.72 Tc(MIN.) = 19.71  
AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.83 EFFECTIVE AREA(ACRES) = 491.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13021.00 TO NODE 13022.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 843.84 DOWNSTREAM(FEET) = 842.14  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1448.62 CHANNEL SLOPE = 0.0012  
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.92  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.740  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	124.44	0.30	0.803	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.803  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 879.74  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.69  
AVERAGE FLOW DEPTH(FEET) = 3.87 TRAVEL TIME(MIN.) = 6.55  
Tc(MIN.) = 26.26  
SUBAREA AREA(ACRES) = 124.44 SUBAREA RUNOFF(CFS) = 167.88  
EFFECTIVE AREA(ACRES) = 615.47 AREA-AVERAGED Fm(INCH/HR) = 0.25  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83  
TOTAL AREA(ACRES) = 635.2 PEAK FLOW RATE(CFS) = 826.62

GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.74

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.74 FLOW VELOCITY(FEET/SEC.) = 3.62  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13022.00 = 8413.33 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap (DECIMAL)	Ae (ACRES)	HEADWATER NODE
1	826.62	26.26	1.740	0.30( 0.25)	0.83	615.5	13000.00
2	812.15	28.19	1.668	0.30( 0.25)	0.82	635.2	13010.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 826.62 Tc(MIN.) = 26.26  
AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.83 EFFECTIVE AREA(ACRES) = 615.47

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13022.00 TO NODE 13023.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 842.14 DOWNSTREAM(FEET) = 806.85  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1432.95 CHANNEL SLOPE = 0.0246  
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.77  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.656  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	324.46	0.30	0.786	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.786  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1033.98  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.59  
AVERAGE FLOW DEPTH(FEET) = 1.77 TRAVEL TIME(MIN.) = 2.25  
Tc(MIN.) = 28.52  
SUBAREA AREA(ACRES) = 324.46 SUBAREA RUNOFF(CFS) = 414.59  
EFFECTIVE AREA(ACRES) = 939.93 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.81  
TOTAL AREA(ACRES) = 959.7 PEAK FLOW RATE(CFS) = 1194.50  
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.92

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.92 FLOW VELOCITY(FEET/SEC.) = 11.17  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13023.00 = 9846.28 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap (DECIMAL)	Ae (ACRES)	HEADWATER NODE
1	1194.50	28.52	1.656	0.30( 0.24)	0.81	939.9	13000.00
2	1162.67	30.46	1.589	0.30( 0.24)	0.81	959.7	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1194.50 Tc(MIN.) = 28.52  
AREA-AVERAGED Fm(INCH/HR) = 0.24 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.81 EFFECTIVE AREA(ACRES) = 939.93

\*\*\*\*\*

FLOW PROCESS FROM NODE 13023.00 TO NODE 13024.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 806.85 DOWNSTREAM(FEET) = 767.07  
CHANNEL LENGTH THRU SUBAREA(FEET) = 940.17 CHANNEL SLOPE = 0.0423  
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.82

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.614

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	367.12	0.30	0.795	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.795

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1421.77

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.15

AVERAGE FLOW DEPTH(FEET) = 1.81 TRAVEL TIME(MIN.) = 1.11

Tc(MIN.) = 29.62

SUBAREA AREA(ACRES) = 367.12 SUBAREA RUNOFF(CFS) = 454.52

EFFECTIVE AREA(ACRES) = 1307.05 AREA-AVERAGED Fm(INCH/HR) = 0.24

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.81

TOTAL AREA(ACRES) = 1326.8 PEAK FLOW RATE(CFS) = 1613.97

GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.95

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.95 FLOW VELOCITY(FEET/SEC.) = 14.82

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13024.00 = 10786.45 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1613.97	29.62	1.614	0.30( 0.24)	0.81	1307.1	13000.00
2	1578.01	31.58	1.563	0.30( 0.24)	0.81	1326.8	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1613.97 Tc(MIN.) = 29.62

AREA-AVERAGED Fm(INCH/HR) = 0.24 AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.81 EFFECTIVE AREA(ACRES) = 1307.05

\*\*\*\*\*

FLOW PROCESS FROM NODE 13024.00 TO NODE 13025.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 767.07 DOWNSTREAM(FEET) = 697.38  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3026.62 CHANNEL SLOPE = 0.0230  
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.49  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.516

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	315.24	0.30	0.867	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.867

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1792.15

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.60

AVERAGE FLOW DEPTH(FEET) = 2.48 TRAVEL TIME(MIN.) = 4.00

Tc(MIN.) = 33.63

SUBAREA AREA(ACRES) = 315.24 SUBAREA RUNOFF(CFS) = 356.29

EFFECTIVE AREA(ACRES) = 1622.29 AREA-AVERAGED Fm(INCH/HR) = 0.25

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.82

TOTAL AREA(ACRES) = 1642.0 PEAK FLOW RATE(CFS) = 1854.72

GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.53

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.53 FLOW VELOCITY(FEET/SEC.) = 12.74

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13025.00 = 13813.07 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1854.72	33.63	1.516	0.30( 0.25)	0.82	1622.3	13000.00
2	1809.27	35.62	1.470	0.30( 0.25)	0.82	1642.0	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1854.72 Tc(MIN.) = 33.63

AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.82 EFFECTIVE AREA(ACRES) = 1622.29

\*\*\*\*\*

FLOW PROCESS FROM NODE 13025.00 TO NODE 13026.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 697.38 DOWNSTREAM(FEET) = 662.66  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2362.69 CHANNEL SLOPE = 0.0147  
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.06

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.436

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	374.11	0.30	0.748	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.748

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2058.66

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.38

AVERAGE FLOW DEPTH(FEET) = 3.06 TRAVEL TIME(MIN.) = 3.46

Tc(MIN.) = 37.09

SUBAREA AREA(ACRES) = 374.11 SUBAREA RUNOFF(CFS) = 407.82

EFFECTIVE AREA(ACRES) = 1996.40 AREA-AVERAGED Fm(INCH/HR) = 0.24

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.81  
TOTAL AREA (ACRES) = 2016.1 PEAK FLOW RATE (CFS) = 2145.36  
GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.13

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 3.13 FLOW VELOCITY (FEET/SEC.) = 11.54  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13026.00 = 16175.76 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2145.36	37.09	1.436	0.30 ( 0.24)	0.81	1996.4	13000.00
2	2081.63	39.11	1.389	0.30 ( 0.24)	0.81	2016.1	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 2145.36 Tc (MIN.) = 37.09  
AREA-AVERAGED Fm (INCH/HR) = 0.24 AREA-AVERAGED Fp (INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.81 EFFECTIVE AREA (ACRES) = 1996.40

=====  
END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 2016.1 TC (MIN.) = 37.09  
EFFECTIVE AREA (ACRES) = 1996.40 AREA-AVERAGED Fm (INCH/HR) = 0.24  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.805  
PEAK FLOW RATE (CFS) = 2145.36

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2145.36	37.09	1.436	0.30 ( 0.24)	0.81	1996.4	13000.00
2	2081.63	39.11	1.389	0.30 ( 0.24)	0.81	2016.1	13010.00

=====  
END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2010 Advanced Engineering Software (aes)  
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Analysis prepared by:

-----  
FILE NAME: S31.DAT  
TIME/DATE OF STUDY: 11:59 04/03/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 4.440
- 2) 10.00; 3.011
- 3) 15.00; 2.390
- 4) 20.00; 2.029
- 5) 25.00; 1.787
- 6) 30.00; 1.600
- 7) 40.00; 1.368
- 8) 50.00; 1.205
- 9) 60.00; 1.060
- 10) 90.00; 0.862
- 11) 120.00; 0.732
- 12) 180.00; 0.593
- 13) 360.00; 0.412
- 14) 1440.00; 0.172

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13100.00 TO NODE 13101.00 IS CODE = 21  
-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 282.58  
ELEVATION DATA: UPSTREAM(FEET) = 1069.66 DOWNSTREAM(FEET) = 969.92

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.312  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.493  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE      SCS SOIL GROUP      AREA (ACRES)      Fp (INCH/HR)      Ap (DECIMAL)      SCS CN      Tc (MIN.)  
NATURAL FAIR COVER  
"OPEN BRUSH"      -      0.94      0.30      1.000      0      8.31  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 2.70  
TOTAL AREA(ACRES) = 0.94      PEAK FLOW RATE(CFS) = 2.70

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13101.00 TO NODE 13102.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 969.92 DOWNSTREAM(FEET) = 807.20  
CHANNEL LENGTH THRU SUBAREA(FEET) = 665.89 CHANNEL SLOPE = 0.2444  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.27  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.925  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE      SCS SOIL GROUP      AREA (ACRES)      Fp (INCH/HR)      Ap (DECIMAL)      SCS CN  
USER-DEFINED      -      7.67      0.30      1.000      -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.80  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.66  
AVERAGE FLOW DEPTH(FEET) = 0.24 TRAVEL TIME(MIN.) = 2.38  
Tc(MIN.) = 10.69  
SUBAREA AREA(ACRES) = 7.67      SUBAREA RUNOFF(CFS) = 18.12  
EFFECTIVE AREA(ACRES) = 8.61      AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30      AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 8.6      PEAK FLOW RATE(CFS) = 20.34  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.34

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.34      FLOW VELOCITY(FEET/SEC.) = 5.63  
LONGEST FLOWPATH FROM NODE 13100.00 TO NODE 13102.00 = 948.47 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13102.00 TO NODE 13103.00 IS CODE = 56



-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 807.20 DOWNSTREAM(FEET) = 769.94  
CHANNEL LENGTH THRU SUBAREA(FEET) = 691.01 CHANNEL SLOPE = 0.0539  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.84  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.606  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	20.65	0.30	0.999	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.999  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 41.84  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.48  
AVERAGE FLOW DEPTH(FEET) = 0.80 TRAVEL TIME(MIN.) = 2.57  
Tc(MIN.) = 13.26  
SUBAREA AREA(ACRES) = 20.65 SUBAREA RUNOFF(CFS) = 42.86  
EFFECTIVE AREA(ACRES) = 29.26 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 29.3 PEAK FLOW RATE(CFS) = 60.73  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.00

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.00 FLOW VELOCITY(FEET/SEC.) = 5.08  
LONGEST FLOWPATH FROM NODE 13100.00 TO NODE 13103.00 = 1639.48 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13103.00 TO NODE 13104.00 IS CODE = 31  
-----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 769.94 DOWNSTREAM(FEET) = 693.88  
FLOW LENGTH(FEET) = 1563.10 MANNING'S N = 0.013  
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000  
DEPTH OF FLOW IN 36.0 INCH PIPE IS 16.6 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 19.06  
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 60.73  
PIPE TRAVEL TIME(MIN.) = 1.37 Tc(MIN.) = 14.63  
LONGEST FLOWPATH FROM NODE 13100.00 TO NODE 13104.00 = 3202.58 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13103.00 TO NODE 13104.00 IS CODE = 81  
-----

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

=====

MAINLINE Tc(MIN.) = 14.63  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.436  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	20.65	0.30	0.999	-

USER-DEFINED - 28.00 0.30 0.750 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.750  
SUBAREA AREA(ACRES) = 28.00 SUBAREA RUNOFF(CFS) = 55.73  
EFFECTIVE AREA(ACRES) = 57.26 AREA-AVERAGED Fm(INCH/HR) = 0.26  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.88  
TOTAL AREA(ACRES) = 57.3 PEAK FLOW RATE(CFS) = 111.99

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13104.00 TO NODE 13105.00 IS CODE = 31  
-----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 693.88 DOWNSTREAM(FEET) = 645.69  
FLOW LENGTH(FEET) = 1068.98 MANNING'S N = 0.013  
DEPTH OF FLOW IN 36.0 INCH PIPE IS 25.1 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 21.27  
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 111.99  
PIPE TRAVEL TIME(MIN.) = 0.84 Tc(MIN.) = 15.47  
LONGEST FLOWPATH FROM NODE 13100.00 TO NODE 13105.00 = 4271.56 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13104.00 TO NODE 13105.00 IS CODE = 81  
-----

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

=====

MAINLINE Tc(MIN.) = 15.47  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.356  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	35.28	0.30	0.867	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.867  
SUBAREA AREA(ACRES) = 35.28 SUBAREA RUNOFF(CFS) = 66.56  
EFFECTIVE AREA(ACRES) = 92.54 AREA-AVERAGED Fm(INCH/HR) = 0.26  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.87  
TOTAL AREA(ACRES) = 92.5 PEAK FLOW RATE(CFS) = 174.44

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13105.00 TO NODE 13106.00 IS CODE = 31  
-----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 645.69 DOWNSTREAM(FEET) = 608.48  
FLOW LENGTH(FEET) = 1127.55 MANNING'S N = 0.013  
DEPTH OF FLOW IN 45.0 INCH PIPE IS 31.5 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 21.13  
ESTIMATED PIPE DIAMETER(INCH) = 45.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 174.44  
PIPE TRAVEL TIME(MIN.) = 0.89 Tc(MIN.) = 16.35  
LONGEST FLOWPATH FROM NODE 13100.00 TO NODE 13106.00 = 5399.11 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13105.00 TO NODE 13106.00 IS CODE = 81  
-----

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

MAINLINE Tc(MIN.) = 16.35  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.292  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 37.68 0.30 0.889 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.889  
SUBAREA AREA(ACRES) = 37.68 SUBAREA RUNOFF(CFS) = 68.69  
EFFECTIVE AREA(ACRES) = 130.22 AREA-AVERAGED Fm(INCH/HR) = 0.26  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.88  
TOTAL AREA(ACRES) = 130.2 PEAK FLOW RATE(CFS) = 237.78

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13105.00 TO NODE 13106.00 IS CODE = 10  
-----

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

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13025.00 TO NODE 13026.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: S30.DNA  
MEMORY BANK # 2 DEFINED AS FOLLOWS:  
STREAM Q Tc Fp(Fm) Ap Ae HEADWATER  
NUMBER (CFS) (MIN.) (INCH/HR) (ACRES) NODE  
1 2145.36 37.09 0.30( 0.24) 0.81 1996.4 13000.00  
2 2081.63 39.11 0.30( 0.24) 0.81 2016.1 13010.00  
TOTAL AREA(ACRES) = 2016.1

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13025.00 TO NODE 13026.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2145.36	37.09	0.30( 0.24)	0.81	1996.4	13000.00
2	2081.63	39.11	0.30( 0.24)	0.81	2016.1	13010.00
TOTAL AREA(ACRES) = 2016.1						

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13026.00 TO NODE 13106.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 662.66 DOWNSTREAM(FEET) = 608.48  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3098.88 CHANNEL SLOPE = 0.0175  
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.01  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.347  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 75.28 0.30 0.755 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.755  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2183.32  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.29  
AVERAGE FLOW DEPTH(FEET) = 3.01 TRAVEL TIME(MIN.) = 4.20  
Tc(MIN.) = 41.29  
SUBAREA AREA(ACRES) = 75.28 SUBAREA RUNOFF(CFS) = 75.92  
EFFECTIVE AREA(ACRES) = 2071.68 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.80  
TOTAL AREA(ACRES) = 2091.4 PEAK FLOW RATE(CFS) = 2145.36  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.98

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.98 FLOW VELOCITY(FEET/SEC.) = 12.22  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13106.00 = 19274.64 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2145.36	41.29	1.347	0.30( 0.24)	0.80	2071.7	13000.00
2	2081.63	43.35	1.313	0.30( 0.24)	0.80	2091.4	13010.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 2145.36 Tc(MIN.) = 41.29  
AREA-AVERAGED Fm(INCH/HR) = 0.24 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.80 EFFECTIVE AREA(ACRES) = 2071.68

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13105.00 TO NODE 13106.00 IS CODE = 11  
-----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<  
=====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2145.36	41.29	1.347	0.30( 0.24)	0.80	2071.7	13000.00
2	2081.63	43.35	1.313	0.30( 0.24)	0.80	2091.4	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13106.00 = 19274.64 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	237.78	16.35	2.292	0.30( 0.26)	0.88	130.2	13100.00

LONGEST FLOWPATH FROM NODE 13100.00 TO NODE 13106.00 = 5399.11 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1813.83	16.35	2.292	0.30( 0.24)	0.81	950.8	13100.00

2 2272.37 41.29 1.347 0.30( 0.24) 0.81 2201.9 13000.00  
 3 2204.69 43.35 1.313 0.30( 0.24) 0.81 2221.6 13010.00  
 TOTAL AREA (ACRES) = 2221.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 2272.37 Tc (MIN.) = 41.288  
 EFFECTIVE AREA (ACRES) = 2201.90 AREA-AVERAGED Fm (INCH/HR) = 0.24  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.81  
 TOTAL AREA (ACRES) = 2221.6  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13106.00 = 19274.64 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13106.00 TO NODE 13107.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 608.48 DOWNSTREAM (FEET) = 584.29  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1650.20 CHANNEL SLOPE = 0.0147  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 3.32  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.309

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	190.45	0.30	0.755	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.755  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2365.18  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.91  
 AVERAGE FLOW DEPTH (FEET) = 3.31 TRAVEL TIME (MIN.) = 2.31  
 Tc (MIN.) = 43.60

SUBAREA AREA (ACRES) = 190.45 SUBAREA RUNOFF (CFS) = 185.62  
 EFFECTIVE AREA (ACRES) = 2392.35 AREA-AVERAGED Fm (INCH/HR) = 0.24  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.80  
 TOTAL AREA (ACRES) = 2412.1 PEAK FLOW RATE (CFS) = 2300.12  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 3.26

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 3.26 FLOW VELOCITY (FEET/SEC.) = 11.80  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13107.00 = 20924.84 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap (ACRES)	Ae (ACRES)	HEADWATER NODE
1	1924.89	18.81	2.115	0.30( 0.24)	0.80	1141.3	13100.00
2	2300.13	43.60	1.309	0.30( 0.24)	0.80	2392.4	13000.00
3	2245.42	45.69	1.275	0.30( 0.24)	0.80	2412.1	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 2300.13 Tc (MIN.) = 43.60  
 AREA-AVERAGED Fm (INCH/HR) = 0.24 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.80 EFFECTIVE AREA (ACRES) = 2392.35

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13107.00 TO NODE 13108.00 IS CODE = 56  
 -----

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 584.29 DOWNSTREAM (FEET) = 563.78  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1061.67 CHANNEL SLOPE = 0.0193  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.12  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.288

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	314.12	0.30	0.939	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.939  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2442.31  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 13.20  
 AVERAGE FLOW DEPTH (FEET) = 3.12 TRAVEL TIME (MIN.) = 1.34  
 Tc (MIN.) = 44.94

SUBAREA AREA (ACRES) = 314.12 SUBAREA RUNOFF (CFS) = 284.37  
 EFFECTIVE AREA (ACRES) = 2706.47 AREA-AVERAGED Fm (INCH/HR) = 0.25  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.82  
 TOTAL AREA (ACRES) = 2726.2 PEAK FLOW RATE (CFS) = 2537.44  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 3.19

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 3.19 FLOW VELOCITY (FEET/SEC.) = 13.37  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13108.00 = 21986.51 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap (ACRES)	Ae (ACRES)	HEADWATER NODE
1	2317.66	20.20	2.019	0.30( 0.25)	0.83	1455.4	13100.00
2	2537.44	44.94	1.288	0.30( 0.25)	0.82	2706.5	13000.00
3	2472.32	47.04	1.253	0.30( 0.25)	0.82	2726.2	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 2537.44 Tc (MIN.) = 44.94  
 AREA-AVERAGED Fm (INCH/HR) = 0.25 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.82 EFFECTIVE AREA (ACRES) = 2706.47

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13108.00 TO NODE 13109.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 563.78 DOWNSTREAM (FEET) = 541.61  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1657.28 CHANNEL SLOPE = 0.0134  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 3.61  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.250

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
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USER-DEFINED - 203.63 0.30 0.785 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.785  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2630.40  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.96  
 AVERAGE FLOW DEPTH (FEET) = 3.61 TRAVEL TIME (MIN.) = 2.31  
 Tc (MIN.) = 47.25  
 SUBAREA AREA (ACRES) = 203.63 SUBAREA RUNOFF (CFS) = 185.91  
 EFFECTIVE AREA (ACRES) = 2910.10 AREA-AVERAGED Fm (INCH/HR) = 0.25  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.82  
 TOTAL AREA (ACRES) = 2929.8 PEAK FLOW RATE (CFS) = 2631.70  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 3.61

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 3.61 FLOW VELOCITY (FEET/SEC.) = 11.97  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13109.00 = 23643.79 FEET.

**\*\* PEAK FLOW RATE TABLE \*\***  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2474.10	22.56	1.905	0.30 ( 0.25)	0.83	1659.0	13100.00
2	2631.70	47.25	1.250	0.30 ( 0.25)	0.82	2910.1	13000.00
3	2558.77	49.37	1.215	0.30 ( 0.24)	0.82	2929.8	13010.00

 NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 2631.70 Tc (MIN.) = 47.25  
 AREA-AVERAGED Fm (INCH/HR) = 0.25 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.82 EFFECTIVE AREA (ACRES) = 2910.10

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13109.00 TO NODE 13110.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 541.61 DOWNSTREAM (FEET) = 509.94  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2016.96 CHANNEL SLOPE = 0.0157  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 3.55  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.207  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	283.06	0.30	0.791	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.791  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2755.24  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.82  
 AVERAGE FLOW DEPTH (FEET) = 3.54 TRAVEL TIME (MIN.) = 2.62  
 Tc (MIN.) = 49.87  
 SUBAREA AREA (ACRES) = 283.06 SUBAREA RUNOFF (CFS) = 247.08  
 EFFECTIVE AREA (ACRES) = 3193.16 AREA-AVERAGED Fm (INCH/HR) = 0.24  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.81  
 TOTAL AREA (ACRES) = 3212.9 PEAK FLOW RATE (CFS) = 2766.83  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.55

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 3.55 FLOW VELOCITY (FEET/SEC.) = 12.84  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13110.00 = 25660.75 FEET.

**\*\* PEAK FLOW RATE TABLE \*\***  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2678.90	25.21	1.779	0.30 ( 0.25)	0.82	1942.1	13100.00
2	2766.83	49.87	1.207	0.30 ( 0.24)	0.81	3193.2	13000.00
3	2693.60	52.01	1.176	0.30 ( 0.24)	0.81	3212.9	13010.00

 NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 2766.83 Tc (MIN.) = 49.87  
 AREA-AVERAGED Fm (INCH/HR) = 0.24 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.81 EFFECTIVE AREA (ACRES) = 3193.16

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13110.00 TO NODE 13111.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 509.94 DOWNSTREAM (FEET) = 461.07  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 3058.95 CHANNEL SLOPE = 0.0160  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 3.61  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.150  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	248.05	0.30	0.783	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.783  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2869.02  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 13.06  
 AVERAGE FLOW DEPTH (FEET) = 3.61 TRAVEL TIME (MIN.) = 3.90  
 Tc (MIN.) = 53.77  
 SUBAREA AREA (ACRES) = 248.05 SUBAREA RUNOFF (CFS) = 204.37  
 EFFECTIVE AREA (ACRES) = 3441.21 AREA-AVERAGED Fm (INCH/HR) = 0.24  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.81  
 TOTAL AREA (ACRES) = 3460.9 PEAK FLOW RATE (CFS) = 2807.82  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 3.57

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 3.57 FLOW VELOCITY (FEET/SEC.) = 12.97  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13111.00 = 28719.70 FEET.

**\*\* PEAK FLOW RATE TABLE \*\***  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2735.10	29.12	1.633	0.30 ( 0.25)	0.82	2190.1	13100.00
2	2807.82	53.77	1.150	0.30 ( 0.24)	0.81	3441.2	13000.00
3	2725.96	55.95	1.119	0.30 ( 0.24)	0.81	3460.9	13010.00

 NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 2807.82 Tc(MIN.) = 53.77  
AREA-AVERAGED Fm(INCH/HR) = 0.24 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.81 EFFECTIVE AREA(ACRES) = 3441.21

\*\*\*\*\*

FLOW PROCESS FROM NODE 13111.00 TO NODE 13112.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 461.07 DOWNSTREAM(FEET) = 452.77  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1781.78 CHANNEL SLOPE = 0.0047  
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.12  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.100

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	179.91	0.30	0.694	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.694  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2880.05  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.60  
AVERAGE FLOW DEPTH(FEET) = 5.12 TRAVEL TIME(MIN.) = 3.45  
Tc(MIN.) = 57.23

SUBAREA AREA(ACRES) = 179.91 SUBAREA RUNOFF(CFS) = 144.44  
EFFECTIVE AREA(ACRES) = 3621.12 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.81  
TOTAL AREA(ACRES) = 3640.9 PEAK FLOW RATE(CFS) = 2807.82  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.05

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 5.05 FLOW VELOCITY(FEET/SEC.) = 8.54  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13112.00 = 30501.48 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2767.74	32.59	1.540	0.30( 0.24)	0.81	2370.0	13100.00
2	2807.82	57.23	1.100	0.30( 0.24)	0.81	3621.1	13000.00
3	2725.96	59.43	1.068	0.30( 0.24)	0.81	3640.9	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 2807.82 Tc(MIN.) = 57.23  
AREA-AVERAGED Fm(INCH/HR) = 0.24 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.81 EFFECTIVE AREA(ACRES) = 3621.12

\*\*\*\*\*

FLOW PROCESS FROM NODE 13112.00 TO NODE 13222.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 452.77 DOWNSTREAM(FEET) = 427.51  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1625.01 CHANNEL SLOPE = 0.0155

GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.64  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.070

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	155.96	0.30	0.836	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.836  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2865.31  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.94  
AVERAGE FLOW DEPTH(FEET) = 3.63 TRAVEL TIME(MIN.) = 2.09  
Tc(MIN.) = 59.32  
SUBAREA AREA(ACRES) = 155.96 SUBAREA RUNOFF(CFS) = 114.98  
EFFECTIVE AREA(ACRES) = 3777.08 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.81  
TOTAL AREA(ACRES) = 3796.8 PEAK FLOW RATE(CFS) = 2813.34  
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.60

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.60 FLOW VELOCITY(FEET/SEC.) = 12.86  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13222.00 = 32126.49 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2838.21	34.68	1.491	0.30( 0.24)	0.81	2526.0	13100.00
2	2813.34	59.32	1.070	0.30( 0.24)	0.81	3777.1	13000.00
3	2759.60	61.55	1.050	0.30( 0.24)	0.81	3796.8	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 2838.21 Tc(MIN.) = 34.68  
AREA-AVERAGED Fm(INCH/HR) = 0.24 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.81 EFFECTIVE AREA(ACRES) = 2526.01

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 3796.8 TC(MIN.) = 34.68  
EFFECTIVE AREA(ACRES) = 2526.01 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.810  
PEAK FLOW RATE(CFS) = 2838.21

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2838.21	34.68	1.491	0.30( 0.24)	0.81	2526.0	13100.00
2	2813.34	59.32	1.070	0.30( 0.24)	0.81	3777.1	13000.00
3	2759.60	61.55	1.050	0.30( 0.24)	0.81	3796.8	13010.00

END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

-----  
FILE NAME: S32.DAT  
TIME/DATE OF STUDY: 11:59 04/03/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 4.440
- 2) 10.00; 3.011
- 3) 15.00; 2.390
- 4) 20.00; 2.029
- 5) 25.00; 1.787
- 6) 30.00; 1.600
- 7) 40.00; 1.368
- 8) 50.00; 1.205
- 9) 60.00; 1.060
- 10) 90.00; 0.862
- 11) 120.00; 0.732
- 12) 180.00; 0.593
- 13) 360.00; 0.412
- 14) 1440.00; 0.172

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13200.00 TO NODE 13201.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 298.57  
ELEVATION DATA: UPSTREAM(FEET) = 1069.04 DOWNSTREAM(FEET) = 1005.76

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.410  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.180  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE      SCS SOIL GROUP      AREA (ACRES)      Fp (INCH/HR)      Ap (DECIMAL)      SCS CN      Tc (MIN.)  
NATURAL FAIR COVER  
"OPEN BRUSH"      -      0.67      0.30      1.000      0      9.41  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 1.74  
TOTAL AREA(ACRES) = 0.67      PEAK FLOW RATE(CFS) = 1.74

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13201.00 TO NODE 13202.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1005.76 DOWNSTREAM(FEET) = 896.98  
CHANNEL LENGTH THRU SUBAREA(FEET) = 747.55      CHANNEL SLOPE = 0.1455  
GIVEN CHANNEL BASE(FEET) = 10.00      CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000      MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.28  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.657  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE      SCS SOIL GROUP      AREA (ACRES)      Fp (INCH/HR)      Ap (DECIMAL)      SCS CN  
USER-DEFINED      -      7.41      0.30      1.000      -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.69  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.62  
AVERAGE FLOW DEPTH(FEET) = 0.25      TRAVEL TIME(MIN.) = 3.44  
Tc(MIN.) = 12.85  
SUBAREA AREA(ACRES) = 7.41      SUBAREA RUNOFF(CFS) = 15.72  
EFFECTIVE AREA(ACRES) = 8.08      AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30      AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 8.1      PEAK FLOW RATE(CFS) = 17.14  
GIVEN CHANNEL BASE(FEET) = 10.00      CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000      MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.36

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.36      FLOW VELOCITY(FEET/SEC.) = 4.50  
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13202.00 = 1046.12 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13202.00 TO NODE 13203.00 IS CODE = 31

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>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 896.98 DOWNSTREAM(FEET) = 840.27
FLOW LENGTH(FEET) = 1789.59 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
DEPTH OF FLOW IN 36.0 INCH PIPE IS 9.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 11.51
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 17.14
PIPE TRAVEL TIME(MIN.) = 2.59 Tc(MIN.) = 15.44
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13203.00 = 2835.71 FEET.

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FLOW PROCESS FROM NODE 13202.00 TO NODE 13203.00 IS CODE = 81
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>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
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MAINLINE Tc(MIN.) = 15.44
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.358
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
  LAND USE          GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -         38.89    0.30    0.731    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.731
SUBAREA AREA(ACRES) = 38.89 SUBAREA RUNOFF(CFS) = 74.86
EFFECTIVE AREA(ACRES) = 46.97 AREA-AVERAGED Fm(INCH/HR) = 0.23
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.78
TOTAL AREA(ACRES) = 47.0 PEAK FLOW RATE(CFS) = 89.83

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*****
FLOW PROCESS FROM NODE 13203.00 TO NODE 13204.00 IS CODE = 31
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>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 840.27 DOWNSTREAM(FEET) = 782.97
FLOW LENGTH(FEET) = 992.54 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
DEPTH OF FLOW IN 36.0 INCH PIPE IS 19.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 22.40
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 89.83
PIPE TRAVEL TIME(MIN.) = 0.74 Tc(MIN.) = 16.18
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13204.00 = 3828.25 FEET.

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*****
FLOW PROCESS FROM NODE 13203.00 TO NODE 13204.00 IS CODE = 81
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>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
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MAINLINE Tc(MIN.) = 16.18
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.305
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
  LAND USE          GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -         163.73   0.30    0.858    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30

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USER-DEFINED        -         83.09    0.30    0.645    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.645
SUBAREA AREA(ACRES) = 83.09 SUBAREA RUNOFF(CFS) = 157.88
EFFECTIVE AREA(ACRES) = 130.06 AREA-AVERAGED Fm(INCH/HR) = 0.21
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.69
TOTAL AREA(ACRES) = 130.1 PEAK FLOW RATE(CFS) = 245.46

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*****
FLOW PROCESS FROM NODE 13204.00 TO NODE 13205.00 IS CODE = 31
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>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 782.97 DOWNSTREAM(FEET) = 692.52
FLOW LENGTH(FEET) = 2046.57 MANNING'S N = 0.013
DEPTH OF FLOW IN 48.0 INCH PIPE IS 34.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 25.62
ESTIMATED PIPE DIAMETER(INCH) = 48.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 245.46
PIPE TRAVEL TIME(MIN.) = 1.33 Tc(MIN.) = 17.51
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13205.00 = 5874.82 FEET.

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*****
FLOW PROCESS FROM NODE 13204.00 TO NODE 13205.00 IS CODE = 81
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>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
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MAINLINE Tc(MIN.) = 17.51
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.209
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
  LAND USE          GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -         88.51    0.30    0.679    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.679
SUBAREA AREA(ACRES) = 88.51 SUBAREA RUNOFF(CFS) = 159.71
EFFECTIVE AREA(ACRES) = 218.57 AREA-AVERAGED Fm(INCH/HR) = 0.21
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.69
TOTAL AREA(ACRES) = 218.6 PEAK FLOW RATE(CFS) = 393.92

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*****
FLOW PROCESS FROM NODE 13205.00 TO NODE 13206.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 692.52 DOWNSTREAM(FEET) = 605.24
CHANNEL LENGTH THRU SUBAREA(FEET) = 2704.69 CHANNEL SLOPE = 0.0323
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.07
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.947
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
  LAND USE          GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -         163.73   0.30    0.858    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30

```

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.858  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 518.60  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.79  
 AVERAGE FLOW DEPTH(FEET) = 3.00 TRAVEL TIME(MIN.) = 4.18  
 Tc(MIN.) = 21.69  
 SUBAREA AREA(ACRES) = 163.73 SUBAREA RUNOFF(CFS) = 249.01  
 EFFECTIVE AREA(ACRES) = 382.30 AREA-AVERAGED Fm(INCH/HR) = 0.23  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.76  
 TOTAL AREA(ACRES) = 382.3 PEAK FLOW RATE(CFS) = 591.50  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.22 FLOW VELOCITY(FEET/SEC.) = 11.19  
 LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13206.00 = 8579.51 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13206.00 TO NODE 13207.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 605.24 DOWNSTREAM(FEET) = 555.41  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2479.15 CHANNEL SLOPE = 0.0201  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.97  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.753  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	143.41	0.30	0.888	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.888  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 687.51  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.82  
 AVERAGE FLOW DEPTH(FEET) = 3.92 TRAVEL TIME(MIN.) = 4.21  
 Tc(MIN.) = 25.90  
 SUBAREA AREA(ACRES) = 143.41 SUBAREA RUNOFF(CFS) = 191.92  
 EFFECTIVE AREA(ACRES) = 525.71 AREA-AVERAGED Fm(INCH/HR) = 0.24  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.80  
 TOTAL AREA(ACRES) = 525.7 PEAK FLOW RATE(CFS) = 716.72  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.01

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.01 FLOW VELOCITY(FEET/SEC.) = 9.92  
 LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13207.00 = 11058.66 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13207.00 TO NODE 13220.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 555.41 DOWNSTREAM(FEET) = 505.65

CHANNEL LENGTH THRU SUBAREA(FEET) = 1734.55 CHANNEL SLOPE = 0.0287  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.87  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.660

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	123.56	0.30	0.858	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.858  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 794.75  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.63  
 AVERAGE FLOW DEPTH(FEET) = 3.86 TRAVEL TIME(MIN.) = 2.49  
 Tc(MIN.) = 28.39  
 SUBAREA AREA(ACRES) = 123.56 SUBAREA RUNOFF(CFS) = 156.02  
 EFFECTIVE AREA(ACRES) = 649.27 AREA-AVERAGED Fm(INCH/HR) = 0.24  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.81  
 TOTAL AREA(ACRES) = 649.3 PEAK FLOW RATE(CFS) = 828.76  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.94

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.94 FLOW VELOCITY(FEET/SEC.) = 11.76  
 LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13220.00 = 12793.21 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13207.00 TO NODE 13220.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 28.39  
 RAINFALL INTENSITY(INCH/HR) = 1.66  
 AREA-AVERAGED Fm(INCH/HR) = 0.24  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.81  
 EFFECTIVE STREAM AREA(ACRES) = 649.27  
 TOTAL STREAM AREA(ACRES) = 649.27  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 828.76

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13210.00 TO NODE 13211.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 314.51  
 ELEVATION DATA: UPSTREAM(FEET) = 949.80 DOWNSTREAM(FEET) = 828.64

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.525  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.432  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
USER-DEFINED	-	123.56	0.30	0.858	-	-



NATURAL FAIR COVER  
 "OPEN BRUSH" - 1.96 0.30 1.000 0 8.53  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 5.53  
 TOTAL AREA (ACRES) = 1.96 PEAK FLOW RATE (CFS) = 5.53

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13211.00 TO NODE 13212.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 828.64 DOWNSTREAM(FEET) = 767.94  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 652.49 CHANNEL SLOPE = 0.0930  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.48  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.863  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	11.95	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 19.40  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.07  
 AVERAGE FLOW DEPTH(FEET) = 0.44 TRAVEL TIME(MIN.) = 2.67  
 Tc(MIN.) = 11.19  
 SUBAREA AREA(ACRES) = 11.95 SUBAREA RUNOFF(CFS) = 27.56  
 EFFECTIVE AREA(ACRES) = 13.91 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 13.9 PEAK FLOW RATE(CFS) = 32.08  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.59

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.59 FLOW VELOCITY(FEET/SEC.) = 4.86  
 LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13212.00 = 967.00 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13212.00 TO NODE 13213.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 767.94 DOWNSTREAM(FEET) = 706.43  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 967.91 CHANNEL SLOPE = 0.0635  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.97  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.484  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	27.07	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 58.82  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.30  
 AVERAGE FLOW DEPTH(FEET) = 0.94 TRAVEL TIME(MIN.) = 3.05  
 Tc(MIN.) = 14.24  
 SUBAREA AREA(ACRES) = 27.07 SUBAREA RUNOFF(CFS) = 53.22  
 EFFECTIVE AREA(ACRES) = 40.98 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 41.0 PEAK FLOW RATE(CFS) = 80.57  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.12

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.12 FLOW VELOCITY(FEET/SEC.) = 5.89  
 LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13213.00 = 1934.91 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13213.00 TO NODE 13214.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 706.43 DOWNSTREAM(FEET) = 659.31  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 948.11 CHANNEL SLOPE = 0.0497  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.35  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.246  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.09	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 96.41  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.72  
 AVERAGE FLOW DEPTH(FEET) = 1.33 TRAVEL TIME(MIN.) = 2.76  
 Tc(MIN.) = 17.00  
 SUBAREA AREA(ACRES) = 18.09 SUBAREA RUNOFF(CFS) = 31.68  
 EFFECTIVE AREA(ACRES) = 59.07 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 59.1 PEAK FLOW RATE(CFS) = 103.43  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.38

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.38 FLOW VELOCITY(FEET/SEC.) = 5.85  
 LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13214.00 = 2883.02 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13214.00 TO NODE 13215.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 659.31 DOWNSTREAM(FEET) = 628.91

CHANNEL LENGTH THRU SUBAREA (FEET) = 970.24 CHANNEL SLOPE = 0.0313  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.05  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.040  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	71.42	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 159.44  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.69  
 AVERAGE FLOW DEPTH (FEET) = 2.00 TRAVEL TIME (MIN.) = 2.84  
 Tc (MIN.) = 19.84  
 SUBAREA AREA (ACRES) = 71.42 SUBAREA RUNOFF (CFS) = 111.86  
 EFFECTIVE AREA (ACRES) = 130.49 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 130.5 PEAK FLOW RATE (CFS) = 204.38  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.29

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.29 FLOW VELOCITY (FEET/SEC.) = 6.12  
 LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13215.00 = 3853.26 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13215.00 TO NODE 13216.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
 ELEVATION DATA: UPSTREAM (FEET) = 628.91 DOWNSTREAM (FEET) = 598.39  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 922.63 CHANNEL SLOPE = 0.0331  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.42  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.922  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	36.33	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 230.90  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.47  
 AVERAGE FLOW DEPTH (FEET) = 2.41 TRAVEL TIME (MIN.) = 2.38  
 Tc (MIN.) = 22.22  
 SUBAREA AREA (ACRES) = 36.33 SUBAREA RUNOFF (CFS) = 53.02  
 EFFECTIVE AREA (ACRES) = 166.82 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 166.8 PEAK FLOW RATE (CFS) = 243.47  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.48

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 2.48 FLOW VELOCITY (FEET/SEC.) = 6.55  
 LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13216.00 = 4775.89 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13216.00 TO NODE 13217.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
 ELEVATION DATA: UPSTREAM (FEET) = 598.39 DOWNSTREAM (FEET) = 568.48  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 636.40 CHANNEL SLOPE = 0.0470  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.41  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.855  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	42.51	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 273.21  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.69  
 AVERAGE FLOW DEPTH (FEET) = 2.40 TRAVEL TIME (MIN.) = 1.38  
 Tc (MIN.) = 23.60  
 SUBAREA AREA (ACRES) = 42.51 SUBAREA RUNOFF (CFS) = 59.49  
 EFFECTIVE AREA (ACRES) = 209.33 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 209.3 PEAK FLOW RATE (CFS) = 292.93  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.49

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.49 FLOW VELOCITY (FEET/SEC.) = 7.85  
 LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13217.00 = 5412.29 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13217.00 TO NODE 13220.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
 ELEVATION DATA: UPSTREAM (FEET) = 568.48 DOWNSTREAM (FEET) = 505.65  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1896.50 CHANNEL SLOPE = 0.0331  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.98  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.675  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	73.24	0.30	0.951	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.951  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 338.77  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.20  
 AVERAGE FLOW DEPTH (FEET) = 2.96 TRAVEL TIME (MIN.) = 4.39

Tc(MIN.) = 27.99  
 SUBAREA AREA(ACRES) = 73.24 SUBAREA RUNOFF(CFS) = 91.63  
 EFFECTIVE AREA(ACRES) = 282.57 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 282.6 PEAK FLOW RATE(CFS) = 350.74  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.01

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.01 FLOW VELOCITY(FEET/SEC.) = 7.28  
 LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13220.00 = 7308.79 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13217.00 TO NODE 13220.00 IS CODE = 1

-----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<  
 =====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 27.99  
 RAINFALL INTENSITY(INCH/HR) = 1.68  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.99  
 EFFECTIVE STREAM AREA(ACRES) = 282.57  
 TOTAL STREAM AREA(ACRES) = 282.57  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 350.74

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	828.76	28.39	1.660	0.30( 0.24)	0.81	649.3	13200.00
2	350.74	27.99	1.675	0.30( 0.30)	0.99	282.6	13210.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1176.44	27.99	1.675	0.30( 0.26)	0.86	922.7	13210.00
2	1175.70	28.39	1.660	0.30( 0.26)	0.86	931.8	13200.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 1176.44 Tc(MIN.) = 27.99  
 EFFECTIVE AREA(ACRES) = 922.71 AREA-AVERAGED Fm(INCH/HR) = 0.26  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.86  
 TOTAL AREA(ACRES) = 931.8  
 LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13220.00 = 12793.21 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13220.00 TO NODE 13221.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 505.65 DOWNSTREAM(FEET) = 478.94  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1949.14 CHANNEL SLOPE = 0.0137  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.03  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.586

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 108.50 0.30 0.637 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.637  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1244.53  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.33  
 AVERAGE FLOW DEPTH(FEET) = 5.03 TRAVEL TIME(MIN.) = 2.63  
 Tc(MIN.) = 30.62

SUBAREA AREA(ACRES) = 108.50 SUBAREA RUNOFF(CFS) = 136.18  
 EFFECTIVE AREA(ACRES) = 1031.21 AREA-AVERAGED Fm(INCH/HR) = 0.25  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.84  
 TOTAL AREA(ACRES) = 1040.3 PEAK FLOW RATE(CFS) = 1238.13  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.02

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 5.02 FLOW VELOCITY(FEET/SEC.) = 12.32  
 LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13221.00 = 14742.35 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1238.13	30.62	1.586	0.30( 0.25)	0.84	1031.2	13210.00
2	1240.54	31.02	1.576	0.30( 0.25)	0.84	1040.3	13200.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 1240.54 Tc(MIN.) = 31.02  
 AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.84 EFFECTIVE AREA(ACRES) = 1040.34

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13221.00 TO NODE 13222.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 478.94 DOWNSTREAM(FEET) = 427.51  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2078.70 CHANNEL SLOPE = 0.0247  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.43  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.524

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 87.26 0.30 0.699 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.699  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1292.17  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.48

AVERAGE FLOW DEPTH (FEET) = 4.43 TRAVEL TIME (MIN.) = 2.24  
 Tc (MIN.) = 33.26  
 SUBAREA AREA (ACRES) = 87.26 SUBAREA RUNOFF (CFS) = 103.26  
 EFFECTIVE AREA (ACRES) = 1127.60 AREA-AVERAGED Fm (INCH/HR) = 0.25  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83  
 TOTAL AREA (ACRES) = 1127.6 PEAK FLOW RATE (CFS) = 1295.17  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 4.43

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 4.43 FLOW VELOCITY (FEET/SEC.) = 15.50  
 LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13222.00 = 16821.05 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1293.92	32.86	1.534	0.30 (0.25)	0.83	1118.5	13210.00
2	1295.17	33.26	1.524	0.30 (0.25)	0.83	1127.6	13200.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 1295.17 Tc (MIN.) = 33.26  
 AREA-AVERAGED Fm (INCH/HR) = 0.25 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.83 EFFECTIVE AREA (ACRES) = 1127.60

=====  
 END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 1127.6 TC (MIN.) = 33.26  
 EFFECTIVE AREA (ACRES) = 1127.60 AREA-AVERAGED Fm (INCH/HR) = 0.25  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.828  
 PEAK FLOW RATE (CFS) = 1295.17

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1293.92	32.86	1.534	0.30 (0.25)	0.83	1118.5	13210.00
2	1295.17	33.26	1.524	0.30 (0.25)	0.83	1127.6	13200.00

=====  
 END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

-----  
FILE NAME: S33.DAT  
TIME/DATE OF STUDY: 10:46 09/12/2017  
=====

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
-----

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.326
- 2) 10.00; 3.430
- 3) 15.00; 2.635
- 4) 20.00; 2.204
- 5) 25.00; 1.909
- 6) 30.00; 1.717
- 7) 40.00; 1.454
- 8) 50.00; 1.292
- 9) 60.00; 1.184
- 10) 90.00; 0.982
- 11) 120.00; 0.852
- 12) 180.00; 0.728
- 13) 360.00; 0.537
- 14) 1200.00; 0.235

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GUTTER LIP (FT)	GUTTER GEOMETRIES HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 13112.00 TO NODE 13222.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: S31.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap (INCH/HR)	Ae (ACRES)	HEADWATER NODE
1	2838.21	34.68	0.30 ( 0.24)	0.81	2526.0	13100.00
2	2813.34	59.32	0.30 ( 0.24)	0.81	3777.1	13000.00
3	2759.60	61.55	0.30 ( 0.24)	0.81	3796.8	13010.00
TOTAL AREA (ACRES) =						3796.8

\*\*\*\*\*

FLOW PROCESS FROM NODE 13221.00 TO NODE 13222.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: S32.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap (INCH/HR)	Ae (ACRES)	HEADWATER NODE
1	1293.92	32.86	0.30 ( 0.25)	0.83	1118.5	13210.00
2	1295.17	33.26	0.30 ( 0.25)	0.83	1127.6	13200.00
TOTAL AREA (ACRES) =						1127.6

\*\*\*\*\*

FLOW PROCESS FROM NODE 13221.00 TO NODE 13222.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap (INCH/HR)	Ae (ACRES)	HEADWATER NODE
1	1293.92	32.86	0.30 ( 0.25)	0.83	1118.5	13210.00
2	1295.17	33.26	0.30 ( 0.25)	0.83	1127.6	13200.00
TOTAL AREA (ACRES) =						1127.6

\*\*\*\*\*

FLOW PROCESS FROM NODE 13112.00 TO NODE 13222.00 IS CODE = 11  
-----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<<  
=====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap (INCH/HR)	Ae (ACRES)	HEADWATER NODE
1	1293.92	32.86	1.642	0.30 ( 0.25)	0.83	1118.5	13210.00
2	1295.17	33.26	1.631	0.30 ( 0.25)	0.83	1127.6	13200.00
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13222.00 =							16821.05 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap (INCH/HR)	Ae (ACRES)	HEADWATER NODE
1	2838.21	34.68	1.594	0.30 ( 0.24)	0.81	2526.0	13100.00
2	2813.34	59.32	1.192	0.30 ( 0.24)	0.81	3777.1	13000.00

3 2759.60 61.55 1.174 0.30( 0.24) 0.81 3796.8 13010.00  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13222.00 = 32126.49 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4078.10	32.86	1.642	0.30( 0.24)	0.82	3511.6	13210.00
2	4092.03	33.26	1.631	0.30( 0.24)	0.82	3549.7	13200.00
3	4098.34	34.68	1.594	0.30( 0.24)	0.82	3653.6	13100.00
4	3696.95	59.32	1.192	0.30( 0.24)	0.81	4904.7	13000.00
5	3626.53	61.55	1.174	0.30( 0.24)	0.81	4924.4	13010.00
TOTAL AREA (ACRES) =							4924.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 4098.34 Tc (MIN.) = 34.683  
EFFECTIVE AREA (ACRES) = 3653.61 AREA-AVERAGED Fm (INCH/HR) = 0.24  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.82  
TOTAL AREA (ACRES) = 4924.4  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13222.00 = 32126.49 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13222.00 TO NODE 13223.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 427.51 DOWNSTREAM (FEET) = 416.40  
CHANNEL LENGTH THRU SUBAREA (FEET) = 864.00 CHANNEL SLOPE = 0.0129  
GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.51  
CHANNEL FLOW THRU SUBAREA (CFS) = 4098.34  
FLOW VELOCITY (FEET/SEC.) = 11.18 FLOW DEPTH (FEET) = 5.51  
TRAVEL TIME (MIN.) = 1.29 Tc (MIN.) = 35.97  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13223.00 = 32990.49 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4307.96	34.15	1.608	0.30( 0.24)	0.82	3511.6	13210.00
2	4321.58	34.55	1.597	0.30( 0.24)	0.82	3549.7	13200.00
3	4325.21	35.97	1.560	0.30( 0.24)	0.82	3653.6	13100.00
4	4132.92	60.65	1.180	0.30( 0.24)	0.81	4904.7	13000.00
5	4082.96	62.88	1.165	0.30( 0.24)	0.81	4924.4	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 4325.21 Tc (MIN.) = 35.97  
AREA-AVERAGED Fm (INCH/HR) = 0.24 AREA-AVERAGED Fp (INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.82 EFFECTIVE AREA (ACRES) = 3653.61

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13223.00 TO NODE 13223.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13223.00 TO NODE 13223.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610301X.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	72.94	12.28	0.30( 0.30)	1.00	29.3	30100.00
2	62.67	14.93	0.30( 0.30)	1.00	29.7	30110.00
TOTAL AREA (ACRES) =					29.7	

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13223.00 TO NODE 13223.00 IS CODE = 11  
-----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4307.96	34.15	1.608	0.30( 0.24)	0.82	3511.6	13210.00
2	4321.58	34.55	1.597	0.30( 0.24)	0.82	3549.7	13200.00
3	4325.21	35.97	1.560	0.30( 0.24)	0.82	3653.6	13100.00
4	4132.92	60.65	1.180	0.30( 0.24)	0.81	4904.7	13000.00
5	4082.96	62.88	1.165	0.30( 0.24)	0.81	4924.4	13010.00
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13223.00 = 32990.49 FEET.							

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	72.94	12.28	3.067	0.30( 0.30)	1.00	29.3	30100.00
2	62.67	14.93	2.647	0.30( 0.30)	1.00	29.7	30110.00
LONGEST FLOWPATH FROM NODE 30110.00 TO NODE 13223.00 = 2058.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3281.01	12.28	3.067	0.30( 0.25)	0.82	1292.1	30100.00
2	3380.86	14.93	2.647	0.30( 0.25)	0.82	1564.7	30110.00
3	4342.89	34.15	1.608	0.30( 0.25)	0.82	3541.3	13210.00
4	4356.22	34.55	1.597	0.30( 0.25)	0.82	3579.4	13200.00
5	4358.86	35.97	1.560	0.30( 0.24)	0.82	3683.3	13100.00
6	4156.42	60.65	1.180	0.30( 0.24)	0.81	4934.4	13000.00
7	4106.05	62.88	1.165	0.30( 0.24)	0.81	4954.1	13010.00
TOTAL AREA (ACRES) = 4954.1							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 4358.86 Tc (MIN.) = 35.972  
EFFECTIVE AREA (ACRES) = 3683.29 AREA-AVERAGED Fm (INCH/HR) = 0.24  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.82  
TOTAL AREA (ACRES) = 4954.1  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13223.00 = 32990.49 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13223.00 TO NODE 13224.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 416.40 DOWNSTREAM(FEET) = 410.60  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 408.51 CHANNEL SLOPE = 0.0142  
 GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.55  
 CHANNEL FLOW THRU SUBAREA(CFS) = 4358.86  
 FLOW VELOCITY(FEET/SEC.) = 11.79 FLOW DEPTH(FEET) = 5.55  
 TRAVEL TIME(MIN.) = 0.58 Tc(MIN.) = 36.55  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13224.00 = 33399.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3281.01	12.91	2.967	0.30 ( 0.25)	0.82	1292.1	30100.00
2	3380.86	15.55	2.587	0.30 ( 0.25)	0.82	1564.7	30110.00
3	4342.89	34.73	1.593	0.30 ( 0.25)	0.82	3541.3	13210.00
4	4356.22	35.12	1.582	0.30 ( 0.25)	0.82	3579.4	13200.00
5	4358.86	36.55	1.545	0.30 ( 0.24)	0.82	3683.3	13100.00
6	4156.42	61.23	1.176	0.30 ( 0.24)	0.81	4934.4	13000.00
7	4106.05	63.47	1.161	0.30 ( 0.24)	0.81	4954.1	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 4358.86 Tc(MIN.) = 36.55  
 AREA-AVERAGED Fm(INCH/HR) = 0.24 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.82 EFFECTIVE AREA(ACRES) = 3683.29

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13224.00 TO NODE 13224.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13224.00 TO NODE 13224.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610302X.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	32.92	10.37	0.30 ( 0.30)	1.00	11.9	30210.00
2	32.69	10.69	0.30 ( 0.30)	1.00	12.0	30200.00
TOTAL AREA(ACRES) = 12.0						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13224.00 TO NODE 13224.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3281.01	12.91	2.967	0.30 ( 0.25)	0.82	1292.1	30100.00
2	3380.86	15.55	2.587	0.30 ( 0.25)	0.82	1564.7	30110.00
3	4342.89	34.73	1.593	0.30 ( 0.25)	0.82	3541.3	13210.00
4	4356.22	35.12	1.582	0.30 ( 0.25)	0.82	3579.4	13200.00
5	4358.86	36.55	1.545	0.30 ( 0.24)	0.82	3683.3	13100.00

6 4156.42 61.23 1.176 0.30 ( 0.24) 0.81 4934.4 13000.00  
 7 4106.05 63.47 1.161 0.30 ( 0.24) 0.81 4954.1 13010.00  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13224.00 = 33399.00 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	32.92	10.37	3.372	0.30 ( 0.30)	1.00	11.9	30210.00
2	32.69	10.69	3.320	0.30 ( 0.30)	1.00	12.0	30200.00
LONGEST FLOWPATH FROM NODE 30200.00 TO NODE 13224.00 = 1209.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3059.06	10.37	3.372	0.30 ( 0.25)	0.82	1049.4	30210.00
2	3102.20	10.69	3.320	0.30 ( 0.25)	0.82	1082.1	30200.00
3	3309.89	12.91	2.967	0.30 ( 0.25)	0.82	1304.1	30100.00
4	3405.62	15.55	2.587	0.30 ( 0.25)	0.82	1576.7	30110.00
5	4356.88	34.73	1.593	0.30 ( 0.25)	0.82	3553.3	13210.00
6	4370.10	35.12	1.582	0.30 ( 0.25)	0.82	3591.4	13200.00
7	4372.34	36.55	1.545	0.30 ( 0.25)	0.82	3695.3	13100.00
8	4165.91	61.23	1.176	0.30 ( 0.24)	0.81	4946.4	13000.00
9	4115.37	63.47	1.161	0.30 ( 0.24)	0.81	4966.1	13010.00
TOTAL AREA(ACRES) = 4966.1							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 4372.34 Tc(MIN.) = 36.550  
 EFFECTIVE AREA(ACRES) = 3695.32 AREA-AVERAGED Fm(INCH/HR) = 0.25  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.82  
 TOTAL AREA(ACRES) = 4966.1  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13224.00 = 33399.00 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13224.00 TO NODE 13301.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 410.60 DOWNSTREAM(FEET) = 382.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1260.70 CHANNEL SLOPE = 0.0227  
 GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.90  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.505

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	61.66	0.30	0.998	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.998

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4405.79

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.89

AVERAGE FLOW DEPTH(FEET) = 4.90 TRAVEL TIME(MIN.) = 1.51

Tc(MIN.) = 38.06

SUBAREA AREA(ACRES) = 61.66 SUBAREA RUNOFF(CFS) = 66.91

EFFECTIVE AREA(ACRES) = 3756.98 AREA-AVERAGED Fm(INCH/HR) = 0.25

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.82

TOTAL AREA(ACRES) = 5027.8 PEAK FLOW RATE(CFS) = 4372.34

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 4.88

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 4.88 FLOW VELOCITY (FEET/SEC.) = 13.87  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13301.00 = 34659.70 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3059.06	12.05	3.104	0.30 ( 0.25)	0.83	1111.1	30210.00
2	3102.20	12.37	3.053	0.30 ( 0.25)	0.83	1143.8	30200.00
3	3309.89	14.56	2.705	0.30 ( 0.25)	0.83	1365.7	30100.00
4	3405.62	17.18	2.447	0.30 ( 0.25)	0.83	1638.3	30110.00
5	4356.88	36.24	1.553	0.30 ( 0.25)	0.82	3615.0	13210.00
6	4370.10	36.64	1.542	0.30 ( 0.25)	0.82	3653.1	13200.00
7	4372.34	38.06	1.505	0.30 ( 0.25)	0.82	3757.0	13100.00
8	4165.91	62.77	1.166	0.30 ( 0.24)	0.82	5008.1	13000.00
9	4115.37	65.01	1.150	0.30 ( 0.24)	0.82	5027.8	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 4372.34 Tc (MIN.) = 38.06  
 AREA-AVERAGED Fm (INCH/HR) = 0.25 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.82 EFFECTIVE AREA (ACRES) = 3756.98

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13301.00 TO NODE 13301.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610303X.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	282.37	20.28	0.30 ( 0.30)	1.00	166.2	30300.00
TOTAL AREA (ACRES) = 166.2						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13301.00 TO NODE 13301.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3059.06	12.05	3.104	0.30 ( 0.25)	0.83	1111.1	30210.00
2	3102.20	12.37	3.053	0.30 ( 0.25)	0.83	1143.8	30200.00
3	3309.89	14.56	2.705	0.30 ( 0.25)	0.83	1365.7	30100.00
4	3405.62	17.18	2.447	0.30 ( 0.25)	0.83	1638.3	30110.00
5	4356.88	36.24	1.553	0.30 ( 0.25)	0.82	3615.0	13210.00
6	4370.10	36.64	1.542	0.30 ( 0.25)	0.82	3653.1	13200.00
7	4372.34	38.06	1.505	0.30 ( 0.25)	0.82	3757.0	13100.00
8	4165.91	62.77	1.166	0.30 ( 0.24)	0.82	5008.1	13000.00
9	4115.37	65.01	1.150	0.30 ( 0.24)	0.82	5027.8	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13301.00 = 34659.70 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	282.37	20.28	2.188	0.30 ( 0.30)	1.00	166.2	30300.00
LONGEST FLOWPATH FROM NODE 30300.00 TO NODE 13301.00 = 6391.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3308.25	12.05	3.104	0.30 ( 0.25)	0.85	1209.8	30210.00
2	3353.35	12.37	3.053	0.30 ( 0.25)	0.84	1245.2	30200.00
3	3568.10	14.56	2.705	0.30 ( 0.25)	0.84	1485.0	30100.00
4	3677.68	17.18	2.447	0.30 ( 0.25)	0.84	1779.2	30110.00
5	3842.70	20.28	2.188	0.30 ( 0.25)	0.84	2126.1	30300.00
6	4544.29	36.24	1.553	0.30 ( 0.25)	0.83	3781.2	13210.00
7	4555.97	36.64	1.542	0.30 ( 0.25)	0.83	3819.3	13200.00
8	4552.60	38.06	1.505	0.30 ( 0.25)	0.83	3923.2	13100.00
9	4295.40	62.77	1.166	0.30 ( 0.25)	0.82	5174.3	13000.00
10	4242.60	65.01	1.150	0.30 ( 0.25)	0.82	5194.0	13010.00
TOTAL AREA (ACRES) = 5194.0							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 4555.97 Tc (MIN.) = 36.636  
 EFFECTIVE AREA (ACRES) = 3819.31 AREA-AVERAGED Fm (INCH/HR) = 0.25  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83  
 TOTAL AREA (ACRES) = 5194.0

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13301.00 = 34659.70 FEET.

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

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 382.00 DOWNSTREAM (FEET) = 375.00  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1141.09 CHANNEL SLOPE = 0.0061  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 7.15

\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.487

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	9.42	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 4561.00

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.92

AVERAGE FLOW DEPTH (FEET) = 7.15 TRAVEL TIME (MIN.) = 2.13

Tc (MIN.) = 38.77

SUBAREA AREA (ACRES) = 9.42 SUBAREA RUNOFF (CFS) = 10.06

EFFECTIVE AREA (ACRES) = 3828.73 AREA-AVERAGED Fm (INCH/HR) = 0.25

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83

TOTAL AREA (ACRES) = 5203.4 PEAK FLOW RATE (CFS) = 4555.97

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT (FEET) = 7.15



END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 7.15 FLOW VELOCITY(FEET/SEC.) = 8.92

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13302.00 = 35800.79 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3308.25	14.40	2.731	0.30 ( 0.25)	0.85	1219.2	30210.00
2	3353.35	14.71	2.681	0.30 ( 0.25)	0.85	1254.6	30200.00
3	3568.10	16.85	2.476	0.30 ( 0.25)	0.84	1494.4	30100.00
4	3677.68	19.46	2.251	0.30 ( 0.25)	0.84	1788.6	30110.00
5	3842.70	22.53	2.055	0.30 ( 0.25)	0.84	2135.5	30300.00
6	4544.29	38.38	1.497	0.30 ( 0.25)	0.83	3790.6	13210.00
7	4555.97	38.77	1.487	0.30 ( 0.25)	0.83	3828.7	13200.00
8	4552.60	40.19	1.451	0.30 ( 0.25)	0.83	3932.6	13100.00
9	4295.40	64.94	1.151	0.30 ( 0.25)	0.82	5183.7	13000.00
10	4242.60	67.19	1.136	0.30 ( 0.25)	0.82	5203.4	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 4555.97 Tc(MIN.) = 38.77

AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.83 EFFECTIVE AREA(ACRES) = 3828.73

\*\*\*\*\*

FLOW PROCESS FROM NODE 13301.00 TO NODE 13302.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*

FLOW PROCESS FROM NODE 13302.00 TO NODE 13302.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610214X.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	344.94	23.74	0.30 ( 0.30)	1.00	227.7	21400.00
TOTAL AREA(ACRES) = 227.7						

\*\*\*\*\*

FLOW PROCESS FROM NODE 13302.00 TO NODE 13302.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3308.25	14.40	2.731	0.30 ( 0.25)	0.85	1219.2	30210.00
2	3353.35	14.71	2.681	0.30 ( 0.25)	0.85	1254.6	30200.00
3	3568.10	16.85	2.476	0.30 ( 0.25)	0.84	1494.4	30100.00
4	3677.68	19.46	2.251	0.30 ( 0.25)	0.84	1788.6	30110.00
5	3842.70	22.53	2.055	0.30 ( 0.25)	0.84	2135.5	30300.00
6	4544.29	38.38	1.497	0.30 ( 0.25)	0.83	3790.6	13210.00
7	4555.97	38.77	1.487	0.30 ( 0.25)	0.83	3828.7	13200.00
8	4552.60	40.19	1.451	0.30 ( 0.25)	0.83	3932.6	13100.00

9	4295.40	64.94	1.151	0.30 ( 0.25)	0.82	5183.7	13000.00
10	4242.60	67.19	1.136	0.30 ( 0.25)	0.82	5203.4	13010.00
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13302.00 = 35800.79 FEET.							

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	344.94	23.74	1.983	0.30 ( 0.30)	1.00	227.7	21400.00
LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 13302.00 = 6708.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3610.31	14.40	2.731	0.30 ( 0.26)	0.86	1357.3	30210.00
2	3655.66	14.71	2.681	0.30 ( 0.26)	0.86	1395.6	30200.00
3	3884.53	16.85	2.476	0.30 ( 0.26)	0.86	1656.0	30100.00
4	4005.37	19.46	2.251	0.30 ( 0.26)	0.86	1975.2	30110.00
5	4183.96	22.53	2.055	0.30 ( 0.26)	0.85	2351.5	30300.00
6	4241.28	23.74	1.983	0.30 ( 0.26)	0.85	2489.7	21400.00
7	4789.54	38.38	1.497	0.30 ( 0.25)	0.84	4018.3	13210.00
8	4799.12	38.77	1.487	0.30 ( 0.25)	0.84	4056.4	13200.00
9	4788.49	40.19	1.451	0.30 ( 0.25)	0.84	4160.3	13100.00
10	4469.79	64.94	1.151	0.30 ( 0.25)	0.83	5411.3	13000.00
11	4413.88	67.19	1.136	0.30 ( 0.25)	0.83	5431.1	13010.00
TOTAL AREA(ACRES) = 5431.1							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 4799.12 Tc(MIN.) = 38.767

EFFECTIVE AREA(ACRES) = 4056.38 AREA-AVERAGED Fm(INCH/HR) = 0.25

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.84

TOTAL AREA(ACRES) = 5431.1

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13302.00 = 35800.79 FEET.

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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) = 6.60  
 CHANNEL FLOW THRU SUBAREA(CFS) = 4799.12  
 FLOW VELOCITY(FEET/SEC.) = 10.41 FLOW DEPTH(FEET) = 6.60  
 TRAVEL TIME(MIN.) = 3.51 Tc(MIN.) = 42.28  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13303.00 = 37994.75 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3610.31	18.23	2.357	0.30 ( 0.26)	0.86	1357.3	30210.00
2	3655.66	18.52	2.332	0.30 ( 0.26)	0.86	1395.6	30200.00
3	3884.53	20.60	2.169	0.30 ( 0.26)	0.86	1656.0	30100.00
4	4005.37	23.17	2.017	0.30 ( 0.26)	0.86	1975.2	30110.00
5	4183.96	26.19	1.863	0.30 ( 0.26)	0.85	2351.5	30300.00
6	4241.28	27.39	1.817	0.30 ( 0.26)	0.85	2489.7	21400.00

7	4789.54	41.89	1.424	0.30	( 0.25)	0.84	4018.3	13210.00
8	4799.12	42.28	1.417	0.30	( 0.25)	0.84	4056.4	13200.00
9	4788.49	43.71	1.394	0.30	( 0.25)	0.84	4160.3	13100.00
10	4469.79	68.53	1.127	0.30	( 0.25)	0.83	5411.3	13000.00
11	4413.88	70.80	1.111	0.30	( 0.25)	0.83	5431.1	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 4799.12 Tc(MIN.) = 42.28  
 AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.84 EFFECTIVE AREA(ACRES) = 4056.38

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13303.00 TO NODE 13303.00 IS CODE = 12  
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 >>>>CLEAR MEMORY BANK # 2 <<<<<<  
 =====

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13303.00 TO NODE 13303.00 IS CODE = 15.1  
 -----  
 >>>>DEFINE MEMORY BANK # 2 <<<<<<  
 =====

PEAK FLOWRATE TABLE FILE NAME: 0610213X.DNA  
 MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	203.30	15.41	0.30 ( 0.30)	1.00	98.2	21300.00
TOTAL AREA(ACRES) = 98.2						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13303.00 TO NODE 13303.00 IS CODE = 11  
 -----  
 >>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<<  
 =====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3610.31	18.23	2.357	0.30 ( 0.26)	0.86	1357.3	30210.00
2	3655.66	18.52	2.332	0.30 ( 0.26)	0.86	1395.6	30200.00
3	3884.53	20.60	2.169	0.30 ( 0.26)	0.86	1656.0	30100.00
4	4005.37	23.17	2.017	0.30 ( 0.26)	0.86	1975.2	30110.00
5	4183.96	26.19	1.863	0.30 ( 0.26)	0.85	2351.5	30300.00
6	4241.28	27.39	1.817	0.30 ( 0.26)	0.85	2489.7	21400.00
7	4789.54	41.89	1.424	0.30 ( 0.25)	0.84	4018.3	13210.00
8	4799.12	42.28	1.417	0.30 ( 0.25)	0.84	4056.4	13200.00
9	4788.49	43.71	1.394	0.30 ( 0.25)	0.84	4160.3	13100.00
10	4469.79	68.53	1.127	0.30 ( 0.25)	0.83	5411.3	13000.00
11	4413.88	70.80	1.111	0.30 ( 0.25)	0.83	5431.1	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13303.00 = 37994.75 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	203.30	15.41	2.600	0.30 ( 0.30)	1.00	98.2	21300.00

LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 13303.00 = 2988.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
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NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE	
1	3607.90	15.41	2.600	0.30 ( 0.26)	0.87	1245.3	21300.00
2	3792.12	18.23	2.357	0.30 ( 0.26)	0.87	1455.5	30210.00
3	3835.23	18.52	2.332	0.30 ( 0.26)	0.87	1493.8	30200.00
4	4049.74	20.60	2.169	0.30 ( 0.26)	0.87	1754.3	30100.00
5	4157.15	23.17	2.017	0.30 ( 0.26)	0.86	2073.4	30110.00
6	4322.13	26.19	1.863	0.30 ( 0.26)	0.86	2449.7	30300.00
7	4375.38	27.39	1.817	0.30 ( 0.26)	0.86	2587.9	21400.00
8	4888.87	41.89	1.424	0.30 ( 0.25)	0.84	4116.5	13210.00
9	4897.88	42.28	1.417	0.30 ( 0.25)	0.84	4154.6	13200.00
10	4885.21	43.71	1.394	0.30 ( 0.25)	0.84	4258.5	13100.00
11	4542.87	68.53	1.127	0.30 ( 0.25)	0.83	5509.6	13000.00
12	4485.60	70.80	1.111	0.30 ( 0.25)	0.83	5529.3	13010.00
TOTAL AREA(ACRES) = 5529.3							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 4897.88 Tc(MIN.) = 42.280  
 EFFECTIVE AREA(ACRES) = 4154.60 AREA-AVERAGED Fm(INCH/HR) = 0.25  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.84  
 TOTAL AREA(ACRES) = 5529.3

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13303.00 = 37994.75 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13303.00 TO NODE 13304.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<<

\*\*\*\*\*  
 ELEVATION DATA: UPSTREAM(FEET) = 355.00 DOWNSTREAM(FEET) = 350.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 925.40 CHANNEL SLOPE = 0.0054  
 GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 7.70  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.389  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCSSOIL AREA Fp Ap SCSS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 13.84 0.30 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4904.66  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.71  
 AVERAGE FLOW DEPTH(FEET) = 7.70 TRAVEL TIME(MIN.) = 1.77  
 Tc(MIN.) = 44.05  
 SUBAREA AREA(ACRES) = 13.84 SUBAREA RUNOFF(CFS) = 13.56  
 EFFECTIVE AREA(ACRES) = 4168.44 AREA-AVERAGED Fm(INCH/HR) = 0.25  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.84  
 TOTAL AREA(ACRES) = 5543.1 PEAK FLOW RATE(CFS) = 4897.88  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 7.69

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 7.69 FLOW VELOCITY(FEET/SEC.) = 8.71  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13304.00 = 38920.15 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3607.90	17.34	2.433	0.30( 0.26)	0.87	1259.1	21300.00
2	3792.12	20.14	2.196	0.30( 0.26)	0.87	1469.4	30210.00
3	3835.23	20.43	2.179	0.30( 0.26)	0.87	1507.7	30200.00
4	4049.74	22.47	2.058	0.30( 0.26)	0.87	1768.1	30100.00
5	4157.15	25.03	1.908	0.30( 0.26)	0.86	2087.2	30110.00
6	4322.13	28.03	1.792	0.30( 0.26)	0.86	2463.6	30300.00
7	4375.38	29.22	1.747	0.30( 0.26)	0.86	2601.7	21400.00
8	4888.87	43.66	1.395	0.30( 0.25)	0.84	4130.3	13210.00
9	4897.88	44.05	1.389	0.30( 0.25)	0.84	4168.4	13200.00
10	4885.21	45.48	1.366	0.30( 0.25)	0.84	4272.3	13100.00
11	4542.87	70.34	1.115	0.30( 0.25)	0.83	5523.4	13000.00
12	4485.60	72.61	1.099	0.30( 0.25)	0.83	5543.1	13010.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 4897.88 Tc(MIN.) = 44.05  
AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.84 EFFECTIVE AREA(ACRES) = 4168.44

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 3 <<<<<<  
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\*\*\*\*\*  
FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<<  
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PEAK FLOWRATE TABLE FILE NAME: 0610304X.DNA  
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	303.87	18.31	0.30( 0.30)	1.00	164.7	30410.00
2	283.49	23.05	0.30( 0.30)	1.00	182.7	30400.00
TOTAL AREA(ACRES) = 182.7						

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3607.90	17.34	2.433	0.30( 0.26)	0.87	1259.1	21300.00
2	3792.12	20.14	2.196	0.30( 0.26)	0.87	1469.4	30210.00
3	3835.23	20.43	2.179	0.30( 0.26)	0.87	1507.7	30200.00
4	4049.74	22.47	2.058	0.30( 0.26)	0.87	1768.1	30100.00
5	4157.15	25.03	1.908	0.30( 0.26)	0.86	2087.2	30110.00
6	4322.13	28.03	1.792	0.30( 0.26)	0.86	2463.6	30300.00
7	4375.38	29.22	1.747	0.30( 0.26)	0.86	2601.7	21400.00
8	4888.87	43.66	1.395	0.30( 0.25)	0.84	4130.3	13210.00
9	4897.88	44.05	1.389	0.30( 0.25)	0.84	4168.4	13200.00
10	4885.21	45.48	1.366	0.30( 0.25)	0.84	4272.3	13100.00
11	4542.87	70.34	1.115	0.30( 0.25)	0.83	5523.4	13000.00

12 4485.60 72.61 1.099 0.30( 0.25) 0.83 5543.1 13010.00  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13304.00 = 38920.15 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	303.87	18.31	2.350	0.30( 0.30)	1.00	164.7	30410.00
2	283.49	23.05	2.024	0.30( 0.30)	1.00	182.7	30400.00
LONGEST FLOWPATH FROM NODE 30400.00 TO NODE 13304.00 = 5899.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3907.41	17.34	2.433	0.30( 0.27)	0.89	1415.2	21300.00
2	3975.57	18.31	2.350	0.30( 0.27)	0.89	1496.7	30410.00
3	4088.13	20.14	2.196	0.30( 0.27)	0.89	1641.0	30210.00
4	4130.01	20.43	2.179	0.30( 0.27)	0.89	1680.4	30200.00
5	4335.73	22.47	2.058	0.30( 0.26)	0.88	1948.6	30100.00
6	4357.65	23.05	2.024	0.30( 0.26)	0.88	2023.4	30400.00
7	4421.52	25.03	1.908	0.30( 0.26)	0.88	2270.0	30110.00
8	4567.53	28.03	1.792	0.30( 0.26)	0.87	2646.3	30300.00
9	4613.26	29.22	1.747	0.30( 0.26)	0.87	2784.4	21400.00
10	5068.92	43.66	1.395	0.30( 0.25)	0.85	4313.0	13210.00
11	5076.89	44.05	1.389	0.30( 0.25)	0.85	4351.2	13200.00
12	5060.41	45.48	1.366	0.30( 0.25)	0.85	4455.0	13100.00
13	4676.81	70.34	1.115	0.30( 0.25)	0.84	5706.1	13000.00
14	4617.02	72.61	1.099	0.30( 0.25)	0.84	5725.8	13010.00
TOTAL AREA(ACRES) = 5725.8							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 5076.89 Tc(MIN.) = 44.051  
EFFECTIVE AREA(ACRES) = 4351.15 AREA-AVERAGED Fm(INCH/HR) = 0.25  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.87  
TOTAL AREA(ACRES) = 5725.8  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13304.00 = 38920.15 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13304.00 TO NODE 13305.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 350.00 DOWNSTREAM(FEET) = 315.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2966.27 CHANNEL SLOPE = 0.0118  
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.36  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.320  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SC5 SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 27.39 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5089.46  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.59  
AVERAGE FLOW DEPTH(FEET) = 6.36 TRAVEL TIME(MIN.) = 4.27  
Tc(MIN.) = 48.32

SUBAREA AREA (ACRES) = 27.39 SUBAREA RUNOFF (CFS) = 25.14  
 EFFECTIVE AREA (ACRES) = 4378.54 AREA-AVERAGED Fm (INCH/HR) = 0.26  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.85  
 TOTAL AREA (ACRES) = 5753.2 PEAK FLOW RATE (CFS) = 5076.89  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.35

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 6.35 FLOW VELOCITY (FEET/SEC.) = 11.58  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.42 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3907.41	21.96	2.089	0.30 ( 0.27)	0.89	1442.5	21300.00
2	3975.57	22.90	2.033	0.30 ( 0.27)	0.89	1524.1	30410.00
3	4088.13	24.69	1.927	0.30 ( 0.27)	0.89	1668.4	30210.00
4	4130.01	24.96	1.911	0.30 ( 0.27)	0.89	1707.8	30200.00
5	4335.73	26.94	1.834	0.30 ( 0.26)	0.88	1976.0	30100.00
6	4357.65	27.52	1.812	0.30 ( 0.26)	0.88	2050.7	30400.00
7	4421.52	29.48	1.737	0.30 ( 0.26)	0.88	2297.3	30110.00
8	4567.53	32.43	1.653	0.30 ( 0.26)	0.87	2673.7	30300.00
9	4613.26	33.61	1.622	0.30 ( 0.26)	0.87	2811.8	21400.00
10	5068.92	47.93	1.326	0.30 ( 0.26)	0.85	4340.4	13210.00
11	5076.89	48.32	1.320	0.30 ( 0.26)	0.85	4378.5	13200.00
12	5060.41	49.75	1.296	0.30 ( 0.25)	0.85	4482.4	13100.00
13	4676.81	74.71	1.085	0.30 ( 0.25)	0.84	5733.5	13000.00
14	4617.02	77.00	1.070	0.30 ( 0.25)	0.84	5753.2	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 5076.89 Tc (MIN.) = 48.32  
 AREA-AVERAGED Fm (INCH/HR) = 0.26 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.85 EFFECTIVE AREA (ACRES) = 4378.54

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610305X.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	868.29	22.05	0.30 ( 0.30)	1.00	541.0	30520.00
2	864.45	23.46	0.30 ( 0.30)	1.00	565.1	30540.00
3	839.73	24.82	0.30 ( 0.30)	1.00	576.1	30510.00
4	818.41	26.26	0.30 ( 0.30)	1.00	582.8	30500.00
TOTAL AREA (ACRES) =						582.8

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 FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3907.41	21.96	2.089	0.30 ( 0.27)	0.89	1442.5	21300.00
2	3975.57	22.90	2.033	0.30 ( 0.27)	0.89	1524.1	30410.00
3	4088.13	24.69	1.927	0.30 ( 0.27)	0.89	1668.4	30210.00
4	4130.01	24.96	1.911	0.30 ( 0.27)	0.89	1707.8	30200.00
5	4335.73	26.94	1.834	0.30 ( 0.26)	0.88	1976.0	30100.00
6	4357.65	27.52	1.812	0.30 ( 0.26)	0.88	2050.7	30400.00
7	4421.52	29.48	1.737	0.30 ( 0.26)	0.88	2297.3	30110.00
8	4567.53	32.43	1.653	0.30 ( 0.26)	0.87	2673.7	30300.00
9	4613.26	33.61	1.622	0.30 ( 0.26)	0.87	2811.8	21400.00
10	5068.92	47.93	1.326	0.30 ( 0.26)	0.85	4340.4	13210.00
11	5076.89	48.32	1.320	0.30 ( 0.26)	0.85	4378.5	13200.00
12	5060.41	49.75	1.296	0.30 ( 0.25)	0.85	4482.4	13100.00
13	4676.81	74.71	1.085	0.30 ( 0.25)	0.84	5733.5	13000.00
14	4617.02	77.00	1.070	0.30 ( 0.25)	0.84	5753.2	13010.00
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 =							41886.42 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	868.29	22.05	2.083	0.30 ( 0.30)	1.00	541.0	30520.00
2	864.45	23.46	2.000	0.30 ( 0.30)	1.00	565.1	30540.00
3	839.73	24.82	1.920	0.30 ( 0.30)	1.00	576.1	30510.00
4	818.41	26.26	1.860	0.30 ( 0.30)	1.00	582.8	30500.00
LONGEST FLOWPATH FROM NODE 30500.00 TO NODE 13305.00 =							9458.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4774.75	21.96	2.089	0.30 ( 0.28)	0.92	1981.4	21300.00
2	4782.11	22.05	2.083	0.30 ( 0.28)	0.92	1991.2	30520.00
3	4841.54	22.90	2.033	0.30 ( 0.28)	0.92	2079.7	30410.00
4	4875.04	23.46	2.000	0.30 ( 0.28)	0.92	2134.0	30540.00
5	4930.16	24.69	1.927	0.30 ( 0.27)	0.92	2243.5	30210.00
6	4947.27	24.82	1.920	0.30 ( 0.27)	0.92	2262.8	30510.00
7	4967.58	24.96	1.911	0.30 ( 0.27)	0.92	2284.6	30200.00
8	5083.74	26.26	1.860	0.30 ( 0.27)	0.91	2467.1	30500.00
9	5140.50	26.94	1.834	0.30 ( 0.27)	0.91	2558.8	30100.00
10	5150.72	27.52	1.812	0.30 ( 0.27)	0.91	2633.6	30400.00
11	5175.12	29.48	1.737	0.30 ( 0.27)	0.90	2880.2	30110.00
12	5277.17	32.43	1.653	0.30 ( 0.27)	0.90	3256.5	30300.00
13	5306.67	33.61	1.622	0.30 ( 0.27)	0.89	3394.7	21400.00
14	5607.04	47.93	1.326	0.30 ( 0.26)	0.87	4923.3	13210.00
15	5611.72	48.32	1.320	0.30 ( 0.26)	0.87	4961.4	13200.00
16	5583.07	49.75	1.296	0.30 ( 0.26)	0.87	5065.3	13100.00
17	5088.60	74.71	1.085	0.30 ( 0.26)	0.85	6316.3	13000.00
18	5020.70	77.00	1.070	0.30 ( 0.26)	0.85	6336.1	13010.00
TOTAL AREA (ACRES) =						6336.1	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 5611.72 Tc (MIN.) = 48.317  
 EFFECTIVE AREA (ACRES) = 4961.38 AREA-AVERAGED Fm (INCH/HR) = 0.26

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.90  
 TOTAL AREA(ACRES) = 6336.1  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.42 FEET.

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FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.20 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 315.00 DOWNSTREAM(FEET) = 284.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1317.91 CHANNEL SLOPE = 0.0235  
 GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.55  
 CHANNEL FLOW THRU SUBAREA(CFS) = 5611.72  
 FLOW VELOCITY(FEET/SEC.) = 15.17 FLOW DEPTH(FEET) = 5.55  
 TRAVEL TIME(MIN.) = 1.45 Tc(MIN.) = 49.76  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 = 43204.33 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4774.75	23.48	1.999	0.30( 0.28)	0.92	1981.4	21300.00
2	4782.11	23.57	1.993	0.30( 0.28)	0.92	1991.2	30520.00
3	4841.54	24.42	1.943	0.30( 0.28)	0.92	2079.7	30410.00
4	4875.04	24.97	1.911	0.30( 0.28)	0.92	2134.0	30540.00
5	4930.16	26.20	1.863	0.30( 0.27)	0.92	2243.5	30210.00
6	4947.27	26.32	1.858	0.30( 0.27)	0.92	2262.8	30510.00
7	4967.58	26.47	1.852	0.30( 0.27)	0.92	2284.6	30200.00
8	5083.74	27.76	1.803	0.30( 0.27)	0.91	2467.1	30500.00
9	5140.50	28.43	1.777	0.30( 0.27)	0.91	2558.8	30100.00
10	5150.72	29.01	1.755	0.30( 0.27)	0.91	2633.6	30400.00
11	5175.12	30.96	1.691	0.30( 0.27)	0.90	2880.2	30110.00
12	5277.17	33.90	1.614	0.30( 0.27)	0.90	3256.5	30300.00
13	5306.67	35.08	1.583	0.30( 0.27)	0.89	3394.7	21400.00
14	5607.04	49.38	1.302	0.30( 0.26)	0.87	4923.3	13210.00
15	5611.72	49.76	1.296	0.30( 0.26)	0.87	4961.4	13200.00
16	5583.07	51.20	1.279	0.30( 0.26)	0.87	5065.3	13100.00
17	5088.60	76.20	1.075	0.30( 0.26)	0.85	6316.3	13000.00
18	5020.70	78.50	1.059	0.30( 0.26)	0.85	6336.1	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 5611.72 Tc(MIN.) = 49.76  
 AREA-AVERAGED Fm(INCH/HR) = 0.26 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.87 EFFECTIVE AREA(ACRES) = 4961.38

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FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

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FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610306X.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	74.53	18.28	2.352	0.30( 0.30)	1.00	40.4	30600.00
TOTAL AREA(ACRES) =			40.4				

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FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4774.75	23.48	1.999	0.30( 0.28)	0.92	1981.4	21300.00
2	4782.11	23.57	1.993	0.30( 0.28)	0.92	1991.2	30520.00
3	4841.54	24.42	1.943	0.30( 0.28)	0.92	2079.7	30410.00
4	4875.04	24.97	1.911	0.30( 0.28)	0.92	2134.0	30540.00
5	4930.16	26.20	1.863	0.30( 0.27)	0.92	2243.5	30210.00
6	4947.27	26.32	1.858	0.30( 0.27)	0.92	2262.8	30510.00
7	4967.58	26.47	1.852	0.30( 0.27)	0.92	2284.6	30200.00
8	5083.74	27.76	1.803	0.30( 0.27)	0.91	2467.1	30500.00
9	5140.50	28.43	1.777	0.30( 0.27)	0.91	2558.8	30100.00
10	5150.72	29.01	1.755	0.30( 0.27)	0.91	2633.6	30400.00
11	5175.12	30.96	1.691	0.30( 0.27)	0.90	2880.2	30110.00
12	5277.17	33.90	1.614	0.30( 0.27)	0.90	3256.5	30300.00
13	5306.67	35.08	1.583	0.30( 0.27)	0.89	3394.7	21400.00
14	5607.04	49.38	1.302	0.30( 0.26)	0.87	4923.3	13210.00
15	5611.72	49.76	1.296	0.30( 0.26)	0.87	4961.4	13200.00
16	5583.07	51.20	1.279	0.30( 0.26)	0.87	5065.3	13100.00
17	5088.60	76.20	1.075	0.30( 0.26)	0.85	6316.3	13000.00
18	5020.70	78.50	1.059	0.30( 0.26)	0.85	6336.1	13010.00
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 =			43204.33 FEET.				

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	74.53	18.28	2.352	0.30( 0.30)	1.00	40.4	30600.00
LONGEST FLOWPATH FROM NODE 30600.00 TO NODE 13305.20 =			2948.00 FEET.				

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4555.42	18.28	2.352	0.30( 0.28)	0.92	1583.1	30600.00
2	4836.44	23.48	1.999	0.30( 0.28)	0.92	2021.7	21300.00
3	4843.61	23.57	1.993	0.30( 0.28)	0.92	2031.6	30520.00
4	4901.20	24.42	1.943	0.30( 0.28)	0.92	2120.0	30410.00
5	4933.52	24.97	1.911	0.30( 0.28)	0.92	2174.4	30540.00
6	4986.91	26.20	1.863	0.30( 0.28)	0.92	2283.9	30210.00
7	5003.85	26.32	1.858	0.30( 0.28)	0.92	2303.1	30510.00
8	5023.95	26.47	1.852	0.30( 0.28)	0.92	2324.9	30200.00
9	5138.31	27.76	1.803	0.30( 0.27)	0.91	2507.4	30500.00
10	5194.13	28.43	1.777	0.30( 0.27)	0.91	2599.2	30100.00
11	5203.55	29.01	1.755	0.30( 0.27)	0.91	2673.9	30400.00
12	5225.64	30.96	1.691	0.30( 0.27)	0.90	2920.5	30110.00
13	5324.89	33.90	1.614	0.30( 0.27)	0.90	3296.9	30300.00
14	5353.27	35.08	1.583	0.30( 0.27)	0.89	3435.0	21400.00

15 5643.44 49.38 1.302 0.30( 0.26) 0.87 4963.6 13210.00  
 16 5647.89 49.76 1.296 0.30( 0.26) 0.87 5001.7 13200.00  
 17 5618.63 51.20 1.279 0.30( 0.26) 0.87 5105.6 13100.00  
 18 5116.75 76.20 1.075 0.30( 0.26) 0.86 6356.7 13000.00  
 19 5048.28 78.50 1.059 0.30( 0.26) 0.85 6376.4 13010.00  
 TOTAL AREA (ACRES) = 6376.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 5647.89 Tc(MIN.) = 49.764  
 EFFECTIVE AREA(ACRES) = 5001.74 AREA-AVERAGED Fm(INCH/HR) = 0.26  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.87  
 TOTAL AREA(ACRES) = 6376.4  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 = 43204.33 FEET.

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 FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.40 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
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ELEVATION DATA: UPSTREAM(FEET) = 284.00 DOWNSTREAM(FEET) = 274.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 826.37 CHANNEL SLOPE = 0.0121  
 GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 6.68  
 CHANNEL FLOW THRU SUBAREA(CFS) = 5647.89  
 FLOW VELOCITY(FEET/SEC.) = 12.07 FLOW DEPTH(FEET) = 6.68  
 TRAVEL TIME(MIN.) = 1.14 Tc(MIN.) = 50.91  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.40 = 44030.70 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4555.42	19.50	2.248	0.30( 0.28)	0.92	1583.1	30600.00
2	4836.44	24.68	1.928	0.30( 0.28)	0.92	2021.7	21300.00
3	4843.61	24.76	1.923	0.30( 0.28)	0.92	2031.6	30520.00
4	4901.20	25.61	1.885	0.30( 0.28)	0.92	2120.0	30410.00
5	4933.52	26.16	1.864	0.30( 0.28)	0.92	2174.4	30540.00
6	4986.91	27.38	1.817	0.30( 0.28)	0.92	2283.9	30210.00
7	5003.85	27.51	1.812	0.30( 0.28)	0.92	2303.1	30510.00
8	5023.95	27.65	1.807	0.30( 0.28)	0.92	2324.9	30200.00
9	5138.31	28.93	1.758	0.30( 0.27)	0.91	2507.4	30500.00
10	5194.13	29.60	1.732	0.30( 0.27)	0.91	2599.2	30100.00
11	5203.55	30.18	1.712	0.30( 0.27)	0.91	2673.9	30400.00
12	5225.64	32.13	1.661	0.30( 0.27)	0.90	2920.5	30110.00
13	5324.89	35.06	1.584	0.30( 0.27)	0.90	3296.9	30300.00
14	5353.27	36.24	1.553	0.30( 0.27)	0.89	3435.0	21400.00
15	5643.44	50.52	1.287	0.30( 0.26)	0.87	4963.6	13210.00
16	5647.89	50.91	1.283	0.30( 0.26)	0.87	5001.7	13200.00
17	5618.63	52.34	1.267	0.30( 0.26)	0.87	5105.6	13100.00
18	5116.75	77.38	1.067	0.30( 0.26)	0.86	6356.7	13000.00
19	5048.28	79.68	1.051	0.30( 0.26)	0.85	6376.4	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 5647.89 Tc(MIN.) = 50.91  
 AREA-AVERAGED Fm(INCH/HR) = 0.26 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.87 EFFECTIVE AREA(ACRES) = 5001.74

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FLOW PROCESS FROM NODE 13305.40 TO NODE 13305.40 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 1 <<<<<  
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\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.40 TO NODE 13305.40 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<  
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PEAK FLOWRATE TABLE FILE NAME: 0610307X.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	185.62	17.68	0.30( 0.30)	1.00	98.0	30700.00
TOTAL AREA(ACRES) = 98.0						

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 FLOW PROCESS FROM NODE 13305.40 TO NODE 13305.40 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4555.42	19.50	2.248	0.30( 0.28)	0.92	1583.1	30600.00
2	4836.44	24.68	1.928	0.30( 0.28)	0.92	2021.7	21300.00
3	4843.61	24.76	1.923	0.30( 0.28)	0.92	2031.6	30520.00
4	4901.20	25.61	1.885	0.30( 0.28)	0.92	2120.0	30410.00
5	4933.52	26.16	1.864	0.30( 0.28)	0.92	2174.4	30540.00
6	4986.91	27.38	1.817	0.30( 0.28)	0.92	2283.9	30210.00
7	5003.85	27.51	1.812	0.30( 0.28)	0.92	2303.1	30510.00
8	5023.95	27.65	1.807	0.30( 0.28)	0.92	2324.9	30200.00
9	5138.31	28.93	1.758	0.30( 0.27)	0.91	2507.4	30500.00
10	5194.13	29.60	1.732	0.30( 0.27)	0.91	2599.2	30100.00
11	5203.55	30.18	1.712	0.30( 0.27)	0.91	2673.9	30400.00
12	5225.64	32.13	1.661	0.30( 0.27)	0.90	2920.5	30110.00
13	5324.89	35.06	1.584	0.30( 0.27)	0.90	3296.9	30300.00
14	5353.27	36.24	1.553	0.30( 0.27)	0.89	3435.0	21400.00
15	5643.44	50.52	1.287	0.30( 0.26)	0.87	4963.6	13210.00
16	5647.89	50.91	1.283	0.30( 0.26)	0.87	5001.7	13200.00
17	5618.63	52.34	1.267	0.30( 0.26)	0.87	5105.6	13100.00
18	5116.75	77.38	1.067	0.30( 0.26)	0.86	6356.7	13000.00
19	5048.28	79.68	1.051	0.30( 0.26)	0.85	6376.4	13010.00
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.40 = 44030.70 FEET.							

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	185.62	17.68	2.405	0.30( 0.30)	1.00	98.0	30700.00
LONGEST FLOWPATH FROM NODE 30700.00 TO NODE 13305.40 = 5192.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4643.92	17.68	2.405	0.30( 0.28)	0.93	1533.0	30700.00
2	4727.19	19.50	2.248	0.30( 0.28)	0.93	1681.1	30600.00

3	4980.02	24.68	1.928	0.30	( 0.28)	0.93	2119.7	21300.00
4	4986.73	24.76	1.923	0.30	( 0.28)	0.93	2129.6	30520.00
5	5041.03	25.61	1.885	0.30	( 0.28)	0.92	2218.0	30410.00
6	5071.48	26.16	1.864	0.30	( 0.28)	0.92	2272.4	30540.00
7	5120.72	27.38	1.817	0.30	( 0.28)	0.92	2381.9	30210.00
8	5137.24	27.51	1.812	0.30	( 0.28)	0.92	2401.1	30510.00
9	5156.86	27.65	1.807	0.30	( 0.28)	0.92	2423.0	30200.00
10	5266.88	28.93	1.758	0.30	( 0.27)	0.92	2605.4	30500.00
11	5320.44	29.60	1.732	0.30	( 0.27)	0.91	2697.2	30100.00
12	5328.07	30.18	1.712	0.30	( 0.27)	0.91	2771.9	30400.00
13	5345.65	32.13	1.661	0.30	( 0.27)	0.91	3018.5	30110.00
14	5438.11	35.06	1.584	0.30	( 0.27)	0.90	3394.9	30300.00
15	5463.77	36.24	1.553	0.30	( 0.27)	0.90	3533.0	21400.00
16	5730.47	50.52	1.287	0.30	( 0.26)	0.87	5061.6	13210.00
17	5734.55	50.91	1.283	0.30	( 0.26)	0.87	5099.7	13200.00
18	5703.92	52.34	1.267	0.30	( 0.26)	0.87	5203.6	13100.00
19	5184.40	77.38	1.067	0.30	( 0.26)	0.86	6454.7	13000.00
20	5114.56	79.68	1.051	0.30	( 0.26)	0.86	6474.4	13010.00

TOTAL AREA (ACRES) = 6474.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 5734.55 Tc(MIN.) = 50.905  
EFFECTIVE AREA(ACRES) = 5099.74 AREA-AVERAGED Fm(INCH/HR) = 0.26  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.87  
TOTAL AREA(ACRES) = 6474.4  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.40 = 44030.70 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13305.40 TO NODE 13305.60 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 274.00 DOWNSTREAM(FEET) = 258.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 733.85 CHANNEL SLOPE = 0.0218  
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.73  
CHANNEL FLOW THRU SUBAREA(CFS) = 5734.55  
FLOW VELOCITY(FEET/SEC.) = 14.88 FLOW DEPTH(FEET) = 5.73  
TRAVEL TIME(MIN.) = 0.82 Tc(MIN.) = 51.73  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.60 = 44764.55 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4643.92	18.55	2.329	0.30( 0.28)	0.93	1533.0	30700.00
2	4727.19	20.37	2.182	0.30( 0.28)	0.93	1681.1	30600.00
3	4980.02	25.53	1.888	0.30( 0.28)	0.93	2119.7	21300.00
4	4986.73	25.62	1.885	0.30( 0.28)	0.93	2129.6	30520.00
5	5041.03	26.47	1.852	0.30( 0.28)	0.92	2218.0	30410.00
6	5071.48	27.02	1.831	0.30( 0.28)	0.92	2272.4	30540.00
7	5120.72	28.23	1.784	0.30( 0.28)	0.92	2381.9	30210.00
8	5137.24	28.36	1.780	0.30( 0.28)	0.92	2401.1	30510.00
9	5156.86	28.50	1.774	0.30( 0.28)	0.92	2423.0	30200.00
10	5266.88	29.77	1.725	0.30( 0.27)	0.92	2605.4	30500.00
11	5320.44	30.44	1.705	0.30( 0.27)	0.91	2697.2	30100.00
12	5328.07	31.02	1.690	0.30( 0.27)	0.91	2771.9	30400.00

13	5345.65	32.97	1.639	0.30	( 0.27)	0.91	3018.5	30110.00
14	5438.11	35.90	1.562	0.30	( 0.27)	0.90	3394.9	30300.00
15	5463.77	37.07	1.531	0.30	( 0.27)	0.90	3533.0	21400.00
16	5730.47	51.34	1.278	0.30	( 0.26)	0.87	5061.6	13210.00
17	5734.55	51.73	1.274	0.30	( 0.26)	0.87	5099.7	13200.00
18	5703.92	53.17	1.258	0.30	( 0.26)	0.87	5203.6	13100.00
19	5184.40	78.23	1.061	0.30	( 0.26)	0.86	6454.7	13000.00
20	5114.56	80.53	1.046	0.30	( 0.26)	0.86	6474.4	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 5734.55 Tc(MIN.) = 51.73  
AREA-AVERAGED Fm(INCH/HR) = 0.26 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.87 EFFECTIVE AREA(ACRES) = 5099.74

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.60 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 1 <<<<<  
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\*\*\*\*\*  
FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.60 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<  
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PEAK FLOWRATE TABLE FILE NAME: 0610308X.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	125.11	17.21	0.30( 0.30)	1.00	64.8	30800.00

TOTAL AREA(ACRES) = 64.8

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.60 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4643.92	18.55	2.329	0.30( 0.28)	0.93	1533.0	30700.00
2	4727.19	20.37	2.182	0.30( 0.28)	0.93	1681.1	30600.00
3	4980.02	25.53	1.888	0.30( 0.28)	0.93	2119.7	21300.00
4	4986.73	25.62	1.885	0.30( 0.28)	0.93	2129.6	30520.00
5	5041.03	26.47	1.852	0.30( 0.28)	0.92	2218.0	30410.00
6	5071.48	27.02	1.831	0.30( 0.28)	0.92	2272.4	30540.00
7	5120.72	28.23	1.784	0.30( 0.28)	0.92	2381.9	30210.00
8	5137.24	28.36	1.780	0.30( 0.28)	0.92	2401.1	30510.00
9	5156.86	28.50	1.774	0.30( 0.28)	0.92	2423.0	30200.00
10	5266.88	29.77	1.725	0.30( 0.27)	0.92	2605.4	30500.00
11	5320.44	30.44	1.705	0.30( 0.27)	0.91	2697.2	30100.00
12	5328.07	31.02	1.690	0.30( 0.27)	0.91	2771.9	30400.00
13	5345.65	32.97	1.639	0.30( 0.27)	0.91	3018.5	30110.00
14	5438.11	35.90	1.562	0.30( 0.27)	0.90	3394.9	30300.00
15	5463.77	37.07	1.531	0.30( 0.27)	0.90	3533.0	21400.00
16	5730.47	51.34	1.278	0.30( 0.26)	0.87	5061.6	13210.00
17	5734.55	51.73	1.274	0.30( 0.26)	0.87	5099.7	13200.00
18	5703.92	53.17	1.258	0.30( 0.26)	0.87	5203.6	13100.00

19 5184.40 78.23 1.061 0.30( 0.26) 0.86 6454.7 13000.00  
 20 5114.56 80.53 1.046 0.30( 0.26) 0.86 6474.4 13010.00  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.60 = 44764.55 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	125.11	17.21	2.445	0.30( 0.30)	1.00	64.8	30800.00

LONGEST FLOWPATH FROM NODE 30800.00 TO NODE 13305.60 = 4165.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4675.88	17.21	2.445	0.30( 0.28)	0.93	1487.0	30800.00
2	4762.29	18.55	2.329	0.30( 0.28)	0.93	1597.8	30700.00
3	4837.00	20.37	2.182	0.30( 0.28)	0.93	1745.9	30600.00
4	5072.68	25.53	1.888	0.30( 0.28)	0.93	2184.5	21300.00
5	5079.19	25.62	1.885	0.30( 0.28)	0.93	2194.4	30520.00
6	5131.59	26.47	1.852	0.30( 0.28)	0.93	2282.8	30410.00
7	5160.82	27.02	1.831	0.30( 0.28)	0.93	2337.2	30540.00
8	5207.32	28.23	1.784	0.30( 0.28)	0.92	2446.7	30210.00
9	5223.57	28.36	1.780	0.30( 0.28)	0.92	2466.0	30510.00
10	5242.87	28.50	1.774	0.30( 0.28)	0.92	2487.8	30200.00
11	5350.02	29.77	1.725	0.30( 0.28)	0.92	2670.2	30500.00
12	5402.40	30.44	1.705	0.30( 0.27)	0.92	2762.0	30100.00
13	5409.16	31.02	1.690	0.30( 0.27)	0.91	2836.8	30400.00
14	5423.75	32.97	1.639	0.30( 0.27)	0.91	3083.4	30110.00
15	5511.72	35.90	1.562	0.30( 0.27)	0.90	3459.7	30300.00
16	5535.58	37.07	1.531	0.30( 0.27)	0.90	3597.8	21400.00
17	5787.52	51.34	1.278	0.30( 0.26)	0.87	5126.4	13210.00
18	5791.36	51.73	1.274	0.30( 0.26)	0.87	5164.6	13200.00
19	5759.82	53.17	1.258	0.30( 0.26)	0.87	5268.4	13100.00
20	5228.82	78.23	1.061	0.30( 0.26)	0.86	6519.5	13000.00
21	5158.07	80.53	1.046	0.30( 0.26)	0.86	6539.3	13010.00

TOTAL AREA (ACRES) = 6539.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 5791.36 Tc(MIN.) = 51.727  
 EFFECTIVE AREA(ACRES) = 5164.56 AREA-AVERAGED Fm(INCH/HR) = 0.26  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.87  
 TOTAL AREA(ACRES) = 6539.3  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.60 = 44764.55 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.80 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 258.00 DOWNSTREAM(FEET) = 254.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 947.16 CHANNEL SLOPE = 0.0042  
 GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 8.98  
 CHANNEL FLOW THRU SUBAREA(CFS) = 5791.36  
 FLOW VELOCITY(FEET/SEC.) = 8.39 FLOW DEPTH(FEET) = 8.98  
 TRAVEL TIME(MIN.) = 1.88 Tc(MIN.) = 53.61  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.80 = 45711.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4675.88	19.22	2.272	0.30( 0.28)	0.93	1487.0	30800.00
2	4762.29	20.55	2.172	0.30( 0.28)	0.93	1597.8	30700.00
3	4837.00	22.36	2.065	0.30( 0.28)	0.93	1745.9	30600.00
4	5072.68	27.49	1.813	0.30( 0.28)	0.93	2184.5	21300.00
5	5079.19	27.58	1.810	0.30( 0.28)	0.93	2194.4	30520.00
6	5131.59	28.42	1.777	0.30( 0.28)	0.93	2282.8	30410.00
7	5160.82	28.96	1.756	0.30( 0.28)	0.93	2337.2	30540.00
8	5207.32	30.18	1.712	0.30( 0.28)	0.92	2446.7	30210.00
9	5223.57	30.30	1.709	0.30( 0.28)	0.92	2466.0	30510.00
10	5242.87	30.44	1.705	0.30( 0.28)	0.92	2487.8	30200.00
11	5350.02	31.70	1.672	0.30( 0.28)	0.92	2670.2	30500.00
12	5402.40	32.36	1.655	0.30( 0.27)	0.92	2762.0	30100.00
13	5409.16	32.94	1.639	0.30( 0.27)	0.91	2836.8	30400.00
14	5423.75	34.89	1.588	0.30( 0.27)	0.91	3083.4	30110.00
15	5511.72	37.81	1.512	0.30( 0.27)	0.90	3459.7	30300.00
16	5535.58	38.98	1.481	0.30( 0.27)	0.90	3597.8	21400.00
17	5787.52	53.22	1.258	0.30( 0.26)	0.87	5126.4	13210.00
18	5791.36	53.61	1.253	0.30( 0.26)	0.87	5164.6	13200.00
19	5759.82	55.05	1.238	0.30( 0.26)	0.87	5268.4	13100.00
20	5228.82	80.17	1.048	0.30( 0.26)	0.86	6519.5	13000.00
21	5158.07	82.48	1.033	0.30( 0.26)	0.86	6539.3	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 5791.36 Tc(MIN.) = 53.61  
 AREA-AVERAGED Fm(INCH/HR) = 0.26 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.87 EFFECTIVE AREA(ACRES) = 5164.56

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.80 TO NODE 13305.80 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.80 TO NODE 13305.80 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610309X.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	128.75	16.90	0.30( 0.30)	1.00	65.9	30900.00
2	128.64	16.93	0.30( 0.30)	1.00	65.9	30910.00

TOTAL AREA(ACRES) = 65.9

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.80 TO NODE 13305.80 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
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1	4675.88	19.22	2.272	0.30 ( 0.28)	0.93	1487.0	30800.00
2	4762.29	20.55	2.172	0.30 ( 0.28)	0.93	1597.8	30700.00
3	4837.00	22.36	2.065	0.30 ( 0.28)	0.93	1745.9	30600.00
4	5072.68	27.49	1.813	0.30 ( 0.28)	0.93	2184.5	21300.00
5	5079.19	27.58	1.810	0.30 ( 0.28)	0.93	2194.4	30520.00
6	5131.59	28.42	1.777	0.30 ( 0.28)	0.93	2282.8	30410.00
7	5160.82	28.96	1.756	0.30 ( 0.28)	0.93	2337.2	30540.00
8	5207.32	30.18	1.712	0.30 ( 0.28)	0.92	2446.7	30210.00
9	5223.57	30.30	1.709	0.30 ( 0.28)	0.92	2466.0	30510.00
10	5242.87	30.44	1.705	0.30 ( 0.28)	0.92	2487.8	30200.00
11	5350.02	31.70	1.672	0.30 ( 0.28)	0.92	2670.2	30500.00
12	5402.40	32.36	1.655	0.30 ( 0.27)	0.92	2762.0	30100.00
13	5409.16	32.94	1.639	0.30 ( 0.27)	0.91	2836.8	30400.00
14	5423.75	34.89	1.588	0.30 ( 0.27)	0.91	3083.4	30110.00
15	5511.72	37.81	1.512	0.30 ( 0.27)	0.90	3459.7	30300.00
16	5535.58	38.98	1.481	0.30 ( 0.27)	0.90	3597.8	21400.00
17	5787.52	53.22	1.258	0.30 ( 0.26)	0.87	5126.4	13210.00
18	5791.36	53.61	1.253	0.30 ( 0.26)	0.87	5164.6	13200.00
19	5759.82	55.05	1.238	0.30 ( 0.26)	0.87	5268.4	13100.00
20	5228.82	80.17	1.048	0.30 ( 0.26)	0.86	6519.5	13000.00
21	5158.07	82.48	1.033	0.30 ( 0.26)	0.86	6539.3	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.80 = 45711.71 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	128.75	16.90	2.472	0.30 ( 0.30)	1.00	65.9	30900.00
2	128.64	16.93	2.469	0.30 ( 0.30)	1.00	65.9	30910.00

LONGEST FLOWPATH FROM NODE 30900.00 TO NODE 13305.80 = 3403.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4652.25	16.90	2.472	0.30 ( 0.28)	0.93	1373.4	30900.00
2	4655.29	16.93	2.469	0.30 ( 0.28)	0.93	1376.2	30910.00
3	4792.86	19.22	2.272	0.30 ( 0.28)	0.93	1552.9	30800.00
4	4873.35	20.55	2.172	0.30 ( 0.28)	0.93	1663.7	30700.00
5	4941.71	22.36	2.065	0.30 ( 0.28)	0.93	1811.8	30600.00
6	5162.43	27.49	1.813	0.30 ( 0.28)	0.93	2250.5	21300.00
7	5168.74	27.58	1.810	0.30 ( 0.28)	0.93	2260.3	30520.00
8	5219.24	28.42	1.777	0.30 ( 0.28)	0.93	2348.7	30410.00
9	5247.22	28.96	1.756	0.30 ( 0.28)	0.93	2403.1	30540.00
10	5291.08	30.18	1.712	0.30 ( 0.28)	0.93	2512.6	30210.00
11	5307.13	30.30	1.709	0.30 ( 0.28)	0.92	2531.9	30510.00
12	5326.22	30.44	1.705	0.30 ( 0.28)	0.92	2553.7	30200.00
13	5431.40	31.70	1.672	0.30 ( 0.28)	0.92	2736.2	30500.00
14	5482.76	32.36	1.655	0.30 ( 0.28)	0.92	2827.9	30100.00
15	5488.61	32.94	1.639	0.30 ( 0.27)	0.92	2902.7	30400.00
16	5500.17	34.89	1.588	0.30 ( 0.27)	0.91	3149.3	30110.00
17	5583.60	37.81	1.512	0.30 ( 0.27)	0.90	3525.6	30300.00
18	5605.64	38.98	1.481	0.30 ( 0.27)	0.90	3663.8	21400.00
19	5844.32	53.22	1.258	0.30 ( 0.26)	0.88	5192.4	13210.00
20	5847.91	53.61	1.253	0.30 ( 0.26)	0.87	5230.5	13200.00
21	5815.45	55.05	1.238	0.30 ( 0.26)	0.87	5334.4	13100.00
22	5273.20	80.17	1.048	0.30 ( 0.26)	0.86	6585.4	13000.00
23	5201.53	82.48	1.033	0.30 ( 0.26)	0.86	6605.2	13010.00

TOTAL AREA (ACRES) = 6605.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE (CFS) = 5847.91 Tc (MIN.) = 53.610  
 EFFECTIVE AREA (ACRES) = 5230.48 AREA-AVERAGED Fm (INCH/HR) = 0.26  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.90  
 TOTAL AREA (ACRES) = 6605.2  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.80 = 45711.71 FEET.

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FLOW PROCESS FROM NODE 13305.80 TO NODE 13306.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM (FEET) = 254.00 DOWNSTREAM (FEET) = 245.50  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 583.12 CHANNEL SLOPE = 0.0146  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.50  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.245  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	68.77	0.30	0.998	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.998  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 5877.18  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 13.04  
 AVERAGE FLOW DEPTH (FEET) = 6.49 TRAVEL TIME (MIN.) = 0.75  
 Tc (MIN.) = 54.36  
 SUBAREA AREA (ACRES) = 68.77 SUBAREA RUNOFF (CFS) = 58.55  
 EFFECTIVE AREA (ACRES) = 5299.25 AREA-AVERAGED Fm (INCH/HR) = 0.26  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.88  
 TOTAL AREA (ACRES) = 6673.9 PEAK FLOW RATE (CFS) = 5847.91  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.47  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 6.47 FLOW VELOCITY (FEET/SEC.) = 13.02  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13306.00 = 46294.83 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4652.25	17.69	2.403	0.30 ( 0.28)	0.94	1442.2	30900.00
2	4655.29	17.73	2.400	0.30 ( 0.28)	0.94	1444.9	30910.00
3	4792.86	20.01	2.204	0.30 ( 0.28)	0.94	1621.6	30800.00
4	4873.35	21.33	2.126	0.30 ( 0.28)	0.94	1732.5	30700.00
5	4941.71	23.14	2.019	0.30 ( 0.28)	0.93	1880.6	30600.00
6	5162.43	28.27	1.783	0.30 ( 0.28)	0.93	2319.2	21300.00
7	5168.74	28.35	1.780	0.30 ( 0.28)	0.93	2329.1	30520.00
8	5219.24	29.19	1.748	0.30 ( 0.28)	0.93	2417.5	30410.00
9	5247.22	29.73	1.727	0.30 ( 0.28)	0.93	2471.9	30540.00
10	5291.08	30.94	1.692	0.30 ( 0.28)	0.93	2581.4	30210.00
11	5307.13	31.06	1.689	0.30 ( 0.28)	0.93	2600.7	30510.00
12	5326.22	31.20	1.685	0.30 ( 0.28)	0.93	2622.5	30200.00
13	5431.40	32.46	1.652	0.30 ( 0.28)	0.92	2804.9	30500.00

14	5482.76	33.12	1.635	0.30 ( 0.28)	0.92	2896.7	30100.00
15	5488.61	33.70	1.620	0.30 ( 0.28)	0.92	2971.4	30400.00
16	5500.17	35.65	1.568	0.30 ( 0.27)	0.91	3218.1	30110.00
17	5583.60	38.57	1.492	0.30 ( 0.27)	0.91	3594.4	30300.00
18	5605.64	39.74	1.461	0.30 ( 0.27)	0.90	3732.5	21400.00
19	5844.32	53.97	1.249	0.30 ( 0.26)	0.88	5261.1	13210.00
20	5847.91	54.36	1.245	0.30 ( 0.26)	0.88	5299.2	13200.00
21	5815.45	55.80	1.230	0.30 ( 0.26)	0.88	5403.1	13100.00
22	5273.20	80.94	1.043	0.30 ( 0.26)	0.86	6654.2	13000.00
23	5201.53	83.25	1.027	0.30 ( 0.26)	0.86	6673.9	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 5847.91 Tc(MIN.) = 54.36  
 AREA-AVERAGED Fm(INCH/HR) = 0.26 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.88 EFFECTIVE AREA(ACRES) = 5299.25

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FLOW PROCESS FROM NODE 13306.00 TO NODE 13307.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 245.50 DOWNSTREAM(FEET) = 220.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1543.21 CHANNEL SLOPE = 0.0165  
 GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 6.25  
 CHANNEL FLOW THRU SUBAREA(CFS) = 5847.91  
 FLOW VELOCITY(FEET/SEC.) = 13.60 FLOW DEPTH(FEET) = 6.25  
 TRAVEL TIME(MIN.) = 1.89 Tc(MIN.) = 56.25  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13307.00 = 47838.04 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4652.25	19.72	2.228	0.30 ( 0.28)	0.94	1442.2	30900.00
2	4655.29	19.76	2.225	0.30 ( 0.28)	0.94	1444.9	30910.00
3	4792.86	22.02	2.085	0.30 ( 0.28)	0.94	1621.6	30800.00
4	4873.35	23.33	2.007	0.30 ( 0.28)	0.94	1732.5	30700.00
5	4941.71	25.13	1.904	0.30 ( 0.28)	0.93	1880.6	30600.00
6	5162.43	30.23	1.710	0.30 ( 0.28)	0.93	2319.2	21300.00
7	5168.74	30.32	1.708	0.30 ( 0.28)	0.93	2329.1	30520.00
8	5219.24	31.15	1.686	0.30 ( 0.28)	0.93	2417.5	30410.00
9	5247.22	31.69	1.672	0.30 ( 0.28)	0.93	2471.9	30540.00
10	5291.08	32.90	1.641	0.30 ( 0.28)	0.93	2581.4	30210.00
11	5307.13	33.01	1.637	0.30 ( 0.28)	0.93	2600.7	30510.00
12	5326.22	33.15	1.634	0.30 ( 0.28)	0.93	2622.5	30200.00
13	5431.40	34.40	1.601	0.30 ( 0.28)	0.92	2804.9	30500.00
14	5482.76	35.05	1.584	0.30 ( 0.28)	0.92	2896.7	30100.00
15	5488.61	35.62	1.569	0.30 ( 0.28)	0.92	2971.4	30400.00
16	5500.17	37.57	1.518	0.30 ( 0.27)	0.91	3218.1	30110.00
17	5583.60	40.48	1.446	0.30 ( 0.27)	0.91	3594.4	30300.00
18	5605.64	41.65	1.427	0.30 ( 0.27)	0.90	3732.5	21400.00
19	5844.32	55.86	1.229	0.30 ( 0.26)	0.88	5261.1	13210.00
20	5847.91	56.25	1.225	0.30 ( 0.26)	0.88	5299.2	13200.00
21	5815.45	57.69	1.209	0.30 ( 0.26)	0.88	5403.1	13100.00
22	5273.20	82.89	1.030	0.30 ( 0.26)	0.86	6654.2	13000.00
23	5201.53	85.21	1.014	0.30 ( 0.26)	0.86	6673.9	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 5847.91 Tc(MIN.) = 56.25  
 AREA-AVERAGED Fm(INCH/HR) = 0.26 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.88 EFFECTIVE AREA(ACRES) = 5299.25

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FLOW PROCESS FROM NODE 13307.00 TO NODE 13307.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<<

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FLOW PROCESS FROM NODE 13307.00 TO NODE 13307.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610310X.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	161.90	21.14	0.30 ( 0.30)	1.00	97.9	31000.00
TOTAL AREA(ACRES) = 97.9						

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FLOW PROCESS FROM NODE 13307.00 TO NODE 13307.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4652.25	19.72	2.228	0.30 ( 0.28)	0.94	1442.2	30900.00
2	4655.29	19.76	2.225	0.30 ( 0.28)	0.94	1444.9	30910.00
3	4792.86	22.02	2.085	0.30 ( 0.28)	0.94	1621.6	30800.00
4	4873.35	23.33	2.007	0.30 ( 0.28)	0.94	1732.5	30700.00
5	4941.71	25.13	1.904	0.30 ( 0.28)	0.93	1880.6	30600.00
6	5162.43	30.23	1.710	0.30 ( 0.28)	0.93	2319.2	21300.00
7	5168.74	30.32	1.708	0.30 ( 0.28)	0.93	2329.1	30520.00
8	5219.24	31.15	1.686	0.30 ( 0.28)	0.93	2417.5	30410.00
9	5247.22	31.69	1.672	0.30 ( 0.28)	0.93	2471.9	30540.00
10	5291.08	32.90	1.641	0.30 ( 0.28)	0.93	2581.4	30210.00
11	5307.13	33.01	1.637	0.30 ( 0.28)	0.93	2600.7	30510.00
12	5326.22	33.15	1.634	0.30 ( 0.28)	0.93	2622.5	30200.00
13	5431.40	34.40	1.601	0.30 ( 0.28)	0.92	2804.9	30500.00
14	5482.76	35.05	1.584	0.30 ( 0.28)	0.92	2896.7	30100.00
15	5488.61	35.62	1.569	0.30 ( 0.28)	0.92	2971.4	30400.00
16	5500.17	37.57	1.518	0.30 ( 0.27)	0.91	3218.1	30110.00
17	5583.60	40.48	1.446	0.30 ( 0.27)	0.91	3594.4	30300.00
18	5605.64	41.65	1.427	0.30 ( 0.27)	0.90	3732.5	21400.00
19	5844.32	55.86	1.229	0.30 ( 0.26)	0.88	5261.1	13210.00
20	5847.91	56.25	1.225	0.30 ( 0.26)	0.88	5299.2	13200.00
21	5815.45	57.69	1.209	0.30 ( 0.26)	0.88	5403.1	13100.00
22	5273.20	82.89	1.030	0.30 ( 0.26)	0.86	6654.2	13000.00
23	5201.53	85.21	1.014	0.30 ( 0.26)	0.86	6673.9	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13307.00 = 47838.04 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
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NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE
1	161.90	21.14	2.137	0.30 ( 0.30)	1.00	97.9 31000.00

LONGEST FLOWPATH FROM NODE 31000.00 TO NODE 13307.00 = 5162.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4810.80	19.72	2.228	0.30 ( 0.28)	0.94	1533.5	30900.00
2	4813.88	19.76	2.225	0.30 ( 0.28)	0.94	1536.4	30910.00
3	4901.31	21.14	2.137	0.30 ( 0.28)	0.94	1650.9	31000.00
4	4950.19	22.02	2.085	0.30 ( 0.28)	0.94	1719.5	30800.00
5	5023.83	23.33	2.007	0.30 ( 0.28)	0.94	1830.3	30700.00
6	5083.06	25.13	1.904	0.30 ( 0.28)	0.94	1978.5	30600.00
7	5286.75	30.23	1.710	0.30 ( 0.28)	0.93	2417.1	21300.00
8	5292.87	30.32	1.708	0.30 ( 0.28)	0.93	2427.0	30520.00
9	5341.44	31.15	1.686	0.30 ( 0.28)	0.93	2515.4	30410.00
10	5368.17	31.69	1.672	0.30 ( 0.28)	0.93	2569.8	30540.00
11	5409.24	32.90	1.641	0.30 ( 0.28)	0.93	2679.3	30210.00
12	5425.02	33.01	1.637	0.30 ( 0.28)	0.93	2698.5	30510.00
13	5443.80	33.15	1.634	0.30 ( 0.28)	0.93	2720.3	30200.00
14	5546.09	34.40	1.601	0.30 ( 0.28)	0.92	2902.8	30500.00
15	5595.94	35.05	1.584	0.30 ( 0.28)	0.92	2994.6	30100.00
16	5600.47	35.62	1.569	0.30 ( 0.28)	0.92	3069.3	30400.00
17	5607.52	37.57	1.518	0.30 ( 0.27)	0.91	3315.9	30110.00
18	5684.66	40.48	1.446	0.30 ( 0.27)	0.91	3692.3	30300.00
19	5705.03	41.65	1.427	0.30 ( 0.27)	0.91	3830.4	21400.00
20	5926.23	55.86	1.229	0.30 ( 0.26)	0.88	5359.0	13210.00
21	5929.45	56.25	1.225	0.30 ( 0.26)	0.88	5397.1	13200.00
22	5895.61	57.69	1.209	0.30 ( 0.26)	0.88	5501.0	13100.00
23	5337.57	82.89	1.030	0.30 ( 0.26)	0.86	6752.1	13000.00
24	5264.51	85.21	1.014	0.30 ( 0.26)	0.86	6771.8	13010.00

TOTAL AREA (ACRES) = 6771.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 5929.45 Tc (MIN.) = 56.246  
 EFFECTIVE AREA (ACRES) = 5397.13 AREA-AVERAGED Fm (INCH/HR) = 0.26  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.88  
 TOTAL AREA (ACRES) = 6771.8  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13307.00 = 47838.04 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13307.00 TO NODE 13308.00 IS CODE = 56  
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>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>> TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 220.00 DOWNSTREAM (FEET) = 212.00  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 925.62 CHANNEL SLOPE = 0.0086  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 7.51  
 CHANNEL FLOW THRU SUBAREA (CFS) = 5929.45  
 FLOW VELOCITY (FEET/SEC.) = 10.88 FLOW DEPTH (FEET) = 7.51  
 TRAVEL TIME (MIN.) = 1.42 Tc (MIN.) = 57.66  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.66 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4810.80	21.23	2.132	0.30 ( 0.28)	0.94	1533.5	30900.00

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE
1	4810.80	21.23	2.132	0.30 ( 0.28)	0.94	1533.5 30900.00
2	4813.88	21.27	2.130	0.30 ( 0.28)	0.94	1536.4 30910.00
3	4901.31	22.64	2.048	0.30 ( 0.28)	0.94	1650.9 31000.00
4	4950.19	23.51	1.997	0.30 ( 0.28)	0.94	1719.5 30800.00
5	5023.83	24.82	1.919	0.30 ( 0.28)	0.94	1830.3 30700.00
6	5083.06	26.62	1.847	0.30 ( 0.28)	0.94	1978.5 30600.00
7	5286.75	31.70	1.672	0.30 ( 0.28)	0.93	2417.1 21300.00
8	5292.87	31.78	1.670	0.30 ( 0.28)	0.93	2427.0 30520.00
9	5341.44	32.61	1.648	0.30 ( 0.28)	0.93	2515.4 30410.00
10	5368.17	33.15	1.634	0.30 ( 0.28)	0.93	2569.8 30540.00
11	5409.24	34.35	1.602	0.30 ( 0.28)	0.93	2679.3 30210.00
12	5425.02	34.47	1.599	0.30 ( 0.28)	0.93	2698.5 30510.00
13	5443.80	34.60	1.596	0.30 ( 0.28)	0.93	2720.3 30200.00
14	5546.09	35.85	1.563	0.30 ( 0.28)	0.92	2902.8 30500.00
15	5595.94	36.49	1.546	0.30 ( 0.28)	0.92	2994.6 30100.00
16	5600.47	37.07	1.531	0.30 ( 0.28)	0.92	3069.3 30400.00
17	5607.52	39.02	1.480	0.30 ( 0.27)	0.91	3315.9 30110.00
18	5684.66	41.92	1.423	0.30 ( 0.27)	0.91	3692.3 30300.00
19	5705.03	43.09	1.404	0.30 ( 0.27)	0.91	3830.4 21400.00
20	5926.23	57.28	1.214	0.30 ( 0.26)	0.88	5359.0 13210.00
21	5929.45	57.66	1.210	0.30 ( 0.26)	0.88	5397.1 13200.00
22	5895.61	59.11	1.194	0.30 ( 0.26)	0.88	5501.0 13100.00
23	5337.57	84.35	1.020	0.30 ( 0.26)	0.86	6752.1 13000.00
24	5264.51	86.68	1.004	0.30 ( 0.26)	0.86	6771.8 13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 5929.45 Tc (MIN.) = 57.66  
 AREA-AVERAGED Fm (INCH/HR) = 0.26 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.88 EFFECTIVE AREA (ACRES) = 5397.13

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 12  
 -----

>>>> CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 15.1  
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>>>> DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610212X.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	406.83	33.73	0.30 ( 0.30)	1.00	342.8	21200.00

TOTAL AREA (ACRES) = 342.8

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 11  
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>>>> CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4810.80	21.23	2.132	0.30 ( 0.28)	0.94	1533.5	30900.00

2	4813.88	21.27	2.130	0.30 ( 0.28)	0.94	1536.4	30910.00
3	4901.31	22.64	2.048	0.30 ( 0.28)	0.94	1650.9	31000.00
4	4950.19	23.51	1.997	0.30 ( 0.28)	0.94	1719.5	30800.00
5	5023.83	24.82	1.919	0.30 ( 0.28)	0.94	1830.3	30700.00
6	5083.06	26.62	1.847	0.30 ( 0.28)	0.94	1978.5	30600.00
7	5286.75	31.70	1.672	0.30 ( 0.28)	0.93	2417.1	21300.00
8	5292.87	31.78	1.670	0.30 ( 0.28)	0.93	2427.0	30520.00
9	5341.44	32.61	1.648	0.30 ( 0.28)	0.93	2515.4	30410.00
10	5368.17	33.15	1.634	0.30 ( 0.28)	0.93	2569.8	30540.00
11	5409.24	34.35	1.602	0.30 ( 0.28)	0.93	2679.3	30210.00
12	5425.02	34.47	1.599	0.30 ( 0.28)	0.93	2698.5	30510.00
13	5443.80	34.60	1.596	0.30 ( 0.28)	0.93	2720.3	30200.00
14	5546.09	35.85	1.563	0.30 ( 0.28)	0.92	2902.8	30500.00
15	5595.94	36.49	1.546	0.30 ( 0.28)	0.92	2994.6	30100.00
16	5600.47	37.07	1.531	0.30 ( 0.28)	0.92	3069.3	30400.00
17	5607.52	39.02	1.480	0.30 ( 0.27)	0.91	3315.9	30110.00
18	5684.66	41.92	1.423	0.30 ( 0.27)	0.91	3692.3	30300.00
19	5705.03	43.09	1.404	0.30 ( 0.27)	0.91	3830.4	21400.00
20	5926.23	57.28	1.214	0.30 ( 0.26)	0.88	5359.0	13210.00
21	5929.45	57.66	1.210	0.30 ( 0.26)	0.88	5397.1	13200.00
22	5895.61	59.11	1.194	0.30 ( 0.26)	0.88	5501.0	13100.00
23	5337.57	84.35	1.020	0.30 ( 0.26)	0.86	6752.1	13000.00
24	5264.51	86.68	1.004	0.30 ( 0.26)	0.86	6771.8	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.66 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	406.83	33.73	1.619	0.30 ( 0.30)	1.00	342.8	21200.00

LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 13308.00 = 11049.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5166.50	21.23	2.132	0.30 ( 0.28)	0.95	1749.3	30900.00
2	5169.76	21.27	2.130	0.30 ( 0.28)	0.95	1752.6	30910.00
3	5263.36	22.64	2.048	0.30 ( 0.28)	0.95	1881.0	31000.00
4	5315.10	23.51	1.997	0.30 ( 0.28)	0.95	1958.5	30800.00
5	5391.49	24.82	1.919	0.30 ( 0.28)	0.95	2082.6	30700.00
6	5459.60	26.62	1.847	0.30 ( 0.28)	0.95	2249.0	30600.00
7	5684.53	31.70	1.672	0.30 ( 0.28)	0.94	2739.3	21300.00
8	5691.07	31.78	1.670	0.30 ( 0.28)	0.94	2750.0	30520.00
9	5743.53	32.61	1.648	0.30 ( 0.28)	0.94	2846.8	30410.00
10	5772.62	33.15	1.634	0.30 ( 0.28)	0.94	2906.7	30540.00
11	5794.74	33.73	1.619	0.30 ( 0.28)	0.94	2965.2	21200.00
12	5811.01	34.35	1.602	0.30 ( 0.28)	0.94	3022.0	30210.00
13	5825.85	34.47	1.599	0.30 ( 0.28)	0.94	3041.3	30510.00
14	5843.54	34.60	1.596	0.30 ( 0.28)	0.94	3063.1	30200.00
15	5935.78	35.85	1.563	0.30 ( 0.28)	0.93	3245.6	30500.00
16	5980.40	36.49	1.546	0.30 ( 0.28)	0.93	3337.4	30100.00
17	5980.27	37.07	1.531	0.30 ( 0.28)	0.93	3412.1	30400.00
18	5971.56	39.02	1.480	0.30 ( 0.28)	0.92	3658.7	30110.00
19	6031.15	41.92	1.423	0.30 ( 0.27)	0.92	4035.0	30300.00
20	6045.68	43.09	1.404	0.30 ( 0.27)	0.91	4173.2	21400.00
21	6208.10	57.28	1.214	0.30 ( 0.27)	0.89	5701.8	13210.00
22	6210.04	57.66	1.210	0.30 ( 0.27)	0.89	5739.9	13200.00
23	6171.37	59.11	1.194	0.30 ( 0.27)	0.88	5843.8	13100.00
24	5559.69	84.35	1.020	0.30 ( 0.26)	0.87	7094.9	13000.00

25 5481.78 86.68 1.004 0.30 ( 0.26) 0.87 7114.6 13010.00  
TOTAL AREA (ACRES) = 7114.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 6210.04 Tc (MIN.) = 57.664  
EFFECTIVE AREA (ACRES) = 5739.91 AREA-AVERAGED Fm (INCH/HR) = 0.27  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.89  
TOTAL AREA (ACRES) = 7114.6  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.66 FEET.

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FLOW PROCESS FROM NODE 13307.00 TO NODE 13308.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<<

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FLOW PROCESS FROM NODE 13307.00 TO NODE 13308.00 IS CODE = 10

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

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FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<<<

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FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<<

PEAK FLOWRATE TABLE FILE NAME: S29.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20671.71	18.24	0.30 ( 0.30)	0.99	3594.6	50400.00
2	23751.62	27.53	0.30 ( 0.30)	0.99	6309.4	31100.00
3	25884.18	34.42	0.30 ( 0.30)	0.99	8254.0	50150.00
4	27181.63	38.13	0.30 ( 0.30)	0.99	9710.2	12710.00
5	28670.75	45.52	0.30 ( 0.30)	0.99	12609.1	31400.00
6	30184.93	53.75	0.30 ( 0.30)	0.99	15785.5	40100.00
7	31446.76	62.97	0.30 ( 0.30)	0.99	19097.3	11801.00
8	33272.70	73.80	0.30 ( 0.30)	0.99	23677.1	11530.00
9	34271.04	78.19	0.30 ( 0.30)	0.99	25995.0	11701.00
10	35115.75	81.64	0.30 ( 0.30)	0.99	28064.0	11910.00
11	37650.64	91.87	0.30 ( 0.30)	0.99	34783.5	10800.00
12	38294.63	96.11	0.30 ( 0.30)	0.99	37726.2	11130.00
13	38259.52	105.70	0.30 ( 0.30)	0.99	42765.0	12410.00
14	37929.23	113.97	0.30 ( 0.30)	0.99	46507.1	11201.00
15	37611.12	118.93	0.30 ( 0.30)	0.99	48236.8	12201.00
16	36701.56	125.94	0.30 ( 0.30)	0.99	50092.2	12231.00
17	35530.55	133.71	0.30 ( 0.30)	0.99	51728.6	10400.00
18	34311.67	141.60	0.30 ( 0.30)	0.99	53023.1	12010.00
19	33234.81	147.53	0.30 ( 0.30)	0.99	53371.8	10210.00
20	29532.04	175.54	0.30 ( 0.30)	0.99	54110.0	10100.00

TOTAL AREA (ACRES) = 54110.0

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FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 14.0

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20671.71	18.24	0.30 ( 0.30)	0.99	3594.6	50400.00
2	23751.62	27.53	0.30 ( 0.30)	0.99	6309.4	31100.00
3	25884.18	34.42	0.30 ( 0.30)	0.99	8254.0	50150.00
4	27181.63	38.13	0.30 ( 0.30)	0.99	9710.2	12710.00
5	28670.75	45.52	0.30 ( 0.30)	0.99	12609.1	31400.00
6	30184.93	53.75	0.30 ( 0.30)	0.99	15785.5	40100.00
7	31446.76	62.97	0.30 ( 0.30)	0.99	19097.3	11801.00
8	33272.70	73.80	0.30 ( 0.30)	0.99	23677.1	11530.00
9	34271.04	78.19	0.30 ( 0.30)	0.99	25995.0	11701.00
10	35115.75	81.64	0.30 ( 0.30)	0.99	28064.0	11910.00
11	37650.64	91.87	0.30 ( 0.30)	0.99	34783.5	10800.00
12	38294.63	96.11	0.30 ( 0.30)	0.99	37726.2	11130.00
13	38259.52	105.70	0.30 ( 0.30)	0.99	42765.0	12410.00
14	37929.23	113.97	0.30 ( 0.30)	0.99	46507.1	11201.00
15	37611.12	118.93	0.30 ( 0.30)	0.99	48236.8	12201.00
16	36701.56	125.94	0.30 ( 0.30)	0.99	50092.2	12231.00
17	35530.55	133.71	0.30 ( 0.30)	0.99	51728.6	10400.00
18	34311.67	141.60	0.30 ( 0.30)	0.99	53023.1	12010.00
19	33234.81	147.53	0.30 ( 0.30)	0.99	53371.8	10210.00
20	29532.04	175.54	0.30 ( 0.30)	0.99	54110.0	10100.00
TOTAL AREA (ACRES) =						54110.0

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FLOW PROCESS FROM NODE 12904.00 TO NODE 13308.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 213.00 DOWNSTREAM(FEET) = 212.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1389.52 CHANNEL SLOPE = 0.0007  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 17.70  
CHANNEL FLOW THRU SUBAREA(CFS) = 38294.63  
FLOW VELOCITY(FEET/SEC.) = 7.50 FLOW DEPTH(FEET) = 17.70  
TRAVEL TIME(MIN.) = 3.09 Tc(MIN.) = 99.20  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13308.00 = 118090.66 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20671.71	21.96	2.088	0.30 ( 0.30)	0.99	3594.6	50400.00
2	23751.62	31.09	1.688	0.30 ( 0.30)	0.99	6309.4	31100.00
3	25884.18	37.90	1.509	0.30 ( 0.30)	0.99	8254.0	50150.00
4	27181.63	41.56	1.429	0.30 ( 0.30)	0.99	9710.2	12710.00
5	28670.75	48.89	1.310	0.30 ( 0.30)	0.99	12609.1	31400.00
6	30184.93	57.06	1.216	0.30 ( 0.30)	0.99	15785.5	40100.00
7	31446.76	66.24	1.142	0.30 ( 0.30)	0.99	19097.3	11801.00

8	33272.70	77.02	1.069	0.30 ( 0.30)	0.99	23677.1	11530.00
9	34271.04	81.38	1.040	0.30 ( 0.30)	0.99	25995.0	11701.00
10	35115.75	84.81	1.017	0.30 ( 0.30)	0.99	28064.0	11910.00
11	37650.64	94.97	0.960	0.30 ( 0.30)	0.99	34783.5	10800.00
12	38294.63	99.20	0.942	0.30 ( 0.30)	0.99	37726.2	11130.00
13	38259.52	108.79	0.900	0.30 ( 0.30)	0.99	42765.0	12410.00
14	37929.23	117.07	0.864	0.30 ( 0.30)	0.99	46507.1	11201.00
15	37611.12	122.03	0.848	0.30 ( 0.30)	0.99	48236.8	12201.00
16	36701.56	129.07	0.833	0.30 ( 0.30)	0.99	50092.2	12231.00
17	35530.55	136.87	0.817	0.30 ( 0.30)	0.99	51728.6	10400.00
18	34311.67	144.79	0.801	0.30 ( 0.30)	0.99	53023.1	12010.00
19	33234.81	150.75	0.788	0.30 ( 0.30)	0.99	53371.8	10210.00
20	29532.04	178.88	0.730	0.30 ( 0.30)	0.99	54110.0	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 38294.63 Tc(MIN.) = 99.20

AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 37726.23

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FLOW PROCESS FROM NODE 13307.00 TO NODE 13308.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20671.71	21.96	2.088	0.30 ( 0.30)	0.99	3594.6	50400.00
2	23751.62	31.09	1.688	0.30 ( 0.30)	0.99	6309.4	31100.00
3	25884.18	37.90	1.509	0.30 ( 0.30)	0.99	8254.0	50150.00
4	27181.63	41.56	1.429	0.30 ( 0.30)	0.99	9710.2	12710.00
5	28670.75	48.89	1.310	0.30 ( 0.30)	0.99	12609.1	31400.00
6	30184.93	57.06	1.216	0.30 ( 0.30)	0.99	15785.5	40100.00
7	31446.76	66.24	1.142	0.30 ( 0.30)	0.99	19097.3	11801.00
8	33272.70	77.02	1.069	0.30 ( 0.30)	0.99	23677.1	11530.00
9	34271.04	81.38	1.040	0.30 ( 0.30)	0.99	25995.0	11701.00
10	35115.75	84.81	1.017	0.30 ( 0.30)	0.99	28064.0	11910.00
11	37650.64	94.97	0.960	0.30 ( 0.30)	0.99	34783.5	10800.00
12	38294.63	99.20	0.942	0.30 ( 0.30)	0.99	37726.2	11130.00
13	38259.52	108.79	0.900	0.30 ( 0.30)	0.99	42765.0	12410.00
14	37929.23	117.07	0.864	0.30 ( 0.30)	0.99	46507.1	11201.00
15	37611.12	122.03	0.848	0.30 ( 0.30)	0.99	48236.8	12201.00
16	36701.56	129.07	0.833	0.30 ( 0.30)	0.99	50092.2	12231.00
17	35530.55	136.87	0.817	0.30 ( 0.30)	0.99	51728.6	10400.00
18	34311.67	144.79	0.801	0.30 ( 0.30)	0.99	53023.1	12010.00
19	33234.81	150.75	0.788	0.30 ( 0.30)	0.99	53371.8	10210.00
20	29532.04	178.88	0.730	0.30 ( 0.30)	0.99	54110.0	10100.00
LONGEST FLOWPATH FROM NODE							10100.00 TO NODE 13308.00 = 118090.66 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5166.50	21.23	2.132	0.30 ( 0.28)	0.95	1749.3	30900.00
2	5169.76	21.27	2.130	0.30 ( 0.28)	0.95	1752.6	30910.00
3	5263.36	22.64	2.048	0.30 ( 0.28)	0.95	1881.0	31000.00
4	5315.10	23.51	1.997	0.30 ( 0.28)	0.95	1958.5	30800.00
5	5391.49	24.82	1.919	0.30 ( 0.28)	0.95	2082.6	30700.00
6	5459.60	26.62	1.847	0.30 ( 0.28)	0.95	2249.0	30600.00

7	5684.53	31.70	1.672	0.30 ( 0.28)	0.94	2739.3	21300.00
8	5691.07	31.78	1.670	0.30 ( 0.28)	0.94	2750.0	30520.00
9	5743.53	32.61	1.648	0.30 ( 0.28)	0.94	2846.8	30410.00
10	5772.62	33.15	1.634	0.30 ( 0.28)	0.94	2906.7	30540.00
11	5794.74	33.73	1.619	0.30 ( 0.28)	0.94	2965.2	21200.00
12	5811.01	34.35	1.602	0.30 ( 0.28)	0.94	3022.0	30210.00
13	5825.85	34.47	1.599	0.30 ( 0.28)	0.94	3041.3	30510.00
14	5843.54	34.60	1.596	0.30 ( 0.28)	0.94	3063.1	30200.00
15	5935.78	35.85	1.563	0.30 ( 0.28)	0.93	3245.6	30500.00
16	5980.40	36.49	1.546	0.30 ( 0.28)	0.93	3337.4	30100.00
17	5980.27	37.07	1.531	0.30 ( 0.28)	0.93	3412.1	30400.00
18	5971.56	39.02	1.480	0.30 ( 0.28)	0.92	3658.7	30110.00
19	6031.15	41.92	1.423	0.30 ( 0.27)	0.92	4035.0	30300.00
20	6045.68	43.09	1.404	0.30 ( 0.27)	0.91	4173.2	21400.00
21	6208.10	57.28	1.214	0.30 ( 0.27)	0.89	5701.8	13210.00
22	6210.04	57.66	1.210	0.30 ( 0.27)	0.89	5739.9	13200.00
23	6171.37	59.11	1.194	0.30 ( 0.27)	0.88	5843.8	13100.00
24	5559.69	84.35	1.020	0.30 ( 0.26)	0.87	7094.9	13000.00
25	5481.78	86.68	1.004	0.30 ( 0.26)	0.87	7114.6	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.66 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25632.12	21.23	2.132	0.30 ( 0.29)	0.97	5224.3	30900.00
2	25645.98	21.27	2.130	0.30 ( 0.29)	0.97	5233.3	30910.00
3	25888.89	21.96	2.088	0.30 ( 0.29)	0.97	5412.2	50400.00
4	26163.46	22.64	2.048	0.30 ( 0.29)	0.97	5676.9	31000.00
5	26509.36	23.51	1.997	0.30 ( 0.29)	0.97	6013.7	30800.00
6	27027.57	24.82	1.919	0.30 ( 0.29)	0.97	6527.3	30700.00
7	27700.84	26.62	1.847	0.30 ( 0.29)	0.97	7227.0	30600.00
8	29409.46	31.09	1.688	0.30 ( 0.29)	0.97	8990.5	31100.00
9	29625.10	31.70	1.672	0.30 ( 0.29)	0.97	9221.0	21300.00
10	29658.46	31.78	1.670	0.30 ( 0.29)	0.97	9256.2	30520.00
11	29969.61	32.61	1.648	0.30 ( 0.29)	0.97	9588.9	30410.00
12	30167.93	33.15	1.634	0.30 ( 0.29)	0.97	9803.0	30540.00
13	30371.58	33.73	1.619	0.30 ( 0.29)	0.97	10027.1	21200.00
14	30583.91	34.35	1.602	0.30 ( 0.29)	0.97	10262.7	30210.00
15	30635.25	34.47	1.599	0.30 ( 0.29)	0.97	10315.3	30510.00
16	30694.90	34.60	1.596	0.30 ( 0.29)	0.97	10375.3	30200.00
17	31176.65	35.85	1.563	0.30 ( 0.29)	0.97	10913.0	30500.00
18	31423.88	36.49	1.546	0.30 ( 0.29)	0.97	11189.5	30100.00
19	31604.26	37.07	1.531	0.30 ( 0.29)	0.97	11428.8	30400.00
20	31860.74	37.90	1.509	0.30 ( 0.29)	0.97	11771.2	50150.00
21	32252.10	39.02	1.480	0.30 ( 0.29)	0.97	12357.5	30110.00
22	33205.34	41.56	1.429	0.30 ( 0.29)	0.97	13698.2	12710.00
23	33286.43	41.92	1.423	0.30 ( 0.29)	0.97	13888.6	30300.00
24	33538.32	43.09	1.404	0.30 ( 0.29)	0.97	14488.8	21400.00
25	34782.83	48.89	1.310	0.30 ( 0.29)	0.97	17407.2	31400.00
26	36390.55	57.06	1.216	0.30 ( 0.29)	0.96	21464.0	40100.00
27	36422.72	57.28	1.214	0.30 ( 0.29)	0.96	21565.2	13210.00
28	36477.48	57.66	1.210	0.30 ( 0.29)	0.96	21742.0	13200.00
29	36638.21	59.11	1.194	0.30 ( 0.29)	0.96	22369.2	13100.00
30	37445.36	66.24	1.142	0.30 ( 0.29)	0.96	25294.4	11801.00
31	39010.07	77.02	1.069	0.30 ( 0.29)	0.97	30408.5	11530.00
32	39902.78	81.38	1.040	0.30 ( 0.29)	0.97	32942.5	11701.00
33	40562.33	84.35	1.020	0.30 ( 0.29)	0.97	34881.8	13000.00
34	40660.07	84.81	1.017	0.30 ( 0.29)	0.97	35162.8	11910.00

35	41064.37	86.68	1.004	0.30 ( 0.29)	0.97	36416.1	13010.00
36	42808.28	94.97	0.960	0.30 ( 0.29)	0.97	41898.1	10800.00
37	43317.02	99.20	0.942	0.30 ( 0.29)	0.97	44840.8	11130.00
38	42975.27	108.79	0.900	0.30 ( 0.29)	0.98	49879.6	12410.00
39	42380.00	117.07	0.864	0.30 ( 0.29)	0.98	53621.7	11201.00
40	41937.30	122.03	0.848	0.30 ( 0.29)	0.98	55351.4	12201.00
41	40920.70	129.07	0.833	0.30 ( 0.29)	0.98	57206.8	12231.00
42	39631.05	136.87	0.817	0.30 ( 0.29)	0.98	58843.2	10400.00
43	38291.70	144.79	0.801	0.30 ( 0.29)	0.98	60137.7	12010.00
44	37124.16	150.75	0.788	0.30 ( 0.29)	0.98	60486.4	10210.00
45	32993.59	178.88	0.730	0.30 ( 0.29)	0.98	61224.6	10100.00

TOTAL AREA (ACRES) = 61224.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 43317.02 Tc (MIN.) = 99.200  
EFFECTIVE AREA (ACRES) = 44840.84 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA (ACRES) = 61224.6  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13308.00 = 118090.66 FEET.

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 61224.6 TC (MIN.) = 99.20  
EFFECTIVE AREA (ACRES) = 44840.84 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.973  
PEAK FLOW RATE (CFS) = 43317.02

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25632.12	21.23	2.132	0.30 ( 0.29)	0.97	5224.3	30900.00
2	25645.98	21.27	2.130	0.30 ( 0.29)	0.97	5233.3	30910.00
3	25888.89	21.96	2.088	0.30 ( 0.29)	0.97	5412.2	50400.00
4	26163.46	22.64	2.048	0.30 ( 0.29)	0.97	5676.9	31000.00
5	26509.36	23.51	1.997	0.30 ( 0.29)	0.97	6013.7	30800.00
6	27027.57	24.82	1.919	0.30 ( 0.29)	0.97	6527.3	30700.00
7	27700.84	26.62	1.847	0.30 ( 0.29)	0.97	7227.0	30600.00
8	29409.46	31.09	1.688	0.30 ( 0.29)	0.97	8990.5	31100.00
9	29625.10	31.70	1.672	0.30 ( 0.29)	0.97	9221.0	21300.00
10	29658.46	31.78	1.670	0.30 ( 0.29)	0.97	9256.2	30520.00
11	29969.61	32.61	1.648	0.30 ( 0.29)	0.97	9588.9	30410.00
12	30167.93	33.15	1.634	0.30 ( 0.29)	0.97	9803.0	30540.00
13	30371.58	33.73	1.619	0.30 ( 0.29)	0.97	10027.1	21200.00
14	30583.91	34.35	1.602	0.30 ( 0.29)	0.97	10262.7	30210.00
15	30635.25	34.47	1.599	0.30 ( 0.29)	0.97	10315.3	30510.00
16	30694.90	34.60	1.596	0.30 ( 0.29)	0.97	10375.3	30200.00
17	31176.65	35.85	1.563	0.30 ( 0.29)	0.97	10913.0	30500.00
18	31423.88	36.49	1.546	0.30 ( 0.29)	0.97	11189.5	30100.00
19	31604.26	37.07	1.531	0.30 ( 0.29)	0.97	11428.8	30400.00
20	31860.74	37.90	1.509	0.30 ( 0.29)	0.97	11771.2	50150.00
21	32252.10	39.02	1.480	0.30 ( 0.29)	0.97	12357.5	30110.00
22	33205.34	41.56	1.429	0.30 ( 0.29)	0.97	13698.2	12710.00
23	33286.43	41.92	1.423	0.30 ( 0.29)	0.97	13888.6	30300.00
24	33538.32	43.09	1.404	0.30 ( 0.29)	0.97	14488.8	21400.00
25	34782.83	48.89	1.310	0.30 ( 0.29)	0.97	17407.2	31400.00
26	36390.55	57.06	1.216	0.30 ( 0.29)	0.96	21464.0	40100.00
27	36422.72	57.28	1.214	0.30 ( 0.29)	0.96	21565.2	13210.00
28	36477.48	57.66	1.210	0.30 ( 0.29)	0.96	21742.0	13200.00
29	36638.21	59.11	1.194	0.30 ( 0.29)	0.96	22369.2	13100.00

30	37445.36	66.24	1.142	0.30 ( 0.29)	0.96	25294.4	11801.00
31	39010.07	77.02	1.069	0.30 ( 0.29)	0.97	30408.5	11530.00
32	39902.78	81.38	1.040	0.30 ( 0.29)	0.97	32942.5	11701.00
33	40562.33	84.35	1.020	0.30 ( 0.29)	0.97	34881.8	13000.00
34	40660.07	84.81	1.017	0.30 ( 0.29)	0.97	35162.8	11910.00
35	41064.37	86.68	1.004	0.30 ( 0.29)	0.97	36416.1	13010.00
36	42808.28	94.97	0.960	0.30 ( 0.29)	0.97	41898.1	10800.00
37	43317.02	99.20	0.942	0.30 ( 0.29)	0.97	44840.8	11130.00
38	42975.27	108.79	0.900	0.30 ( 0.29)	0.98	49879.6	12410.00
39	42380.00	117.07	0.864	0.30 ( 0.29)	0.98	53621.7	11201.00
40	41937.30	122.03	0.848	0.30 ( 0.29)	0.98	55351.4	12201.00
41	40920.70	129.07	0.833	0.30 ( 0.29)	0.98	57206.8	12231.00
42	39631.05	136.87	0.817	0.30 ( 0.29)	0.98	58843.2	10400.00
43	38291.70	144.79	0.801	0.30 ( 0.29)	0.98	60137.7	12010.00
44	37124.16	150.75	0.788	0.30 ( 0.29)	0.98	60486.4	10210.00
45	32993.59	178.88	0.730	0.30 ( 0.29)	0.98	61224.6	10100.00

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END OF RATIONAL METHOD ANALYSIS

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

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FILE NAME: S34.DAT  
TIME/DATE OF STUDY: 10:46 09/12/2017  
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--\*TIME-OF-CONCENTRATION MODEL\*--  
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USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*

NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.308
- 2) 10.00; 3.422
- 3) 15.00; 2.630
- 4) 20.00; 2.201
- 5) 25.00; 1.906
- 6) 30.00; 1.714
- 7) 40.00; 1.453
- 8) 50.00; 1.291
- 9) 60.00; 1.182
- 10) 90.00; 0.979
- 11) 120.00; 0.849
- 12) 180.00; 0.725
- 13) 360.00; 0.534
- 14) 1200.00; 0.233

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN CROSSFALL (FT)	STREET / SIDE / WAY	CROSSFALL (FT)	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	STREETS (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150	

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

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FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 15.1

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>>>>DEFINE MEMORY BANK # 1 <<<<<<  
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PEAK FLOWRATE TABLE FILE NAME: S33.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	27700.84	26.62	0.30 ( 0.29)	0.97	7227.0	30600.00
2	30694.90	34.60	0.30 ( 0.29)	0.97	10375.3	30200.00
3	32252.10	39.02	0.30 ( 0.29)	0.97	12357.5	30110.00
4	33538.32	43.09	0.30 ( 0.29)	0.97	14488.8	21400.00
5	34782.83	48.89	0.30 ( 0.29)	0.97	17407.2	31400.00
6	36638.21	59.11	0.30 ( 0.29)	0.96	22369.2	13100.00
7	37445.36	66.24	0.30 ( 0.29)	0.96	25294.4	11801.00
8	39010.07	77.02	0.30 ( 0.29)	0.97	30408.5	11530.00
9	39902.78	81.38	0.30 ( 0.29)	0.97	32942.5	11701.00
10	41064.37	86.68	0.30 ( 0.29)	0.97	36416.1	13010.00
11	42808.28	94.97	0.30 ( 0.29)	0.97	41898.1	10800.00
12	43317.02	99.20	0.30 ( 0.29)	0.97	44840.8	11130.00
13	42975.27	108.79	0.30 ( 0.29)	0.98	49879.6	12410.00
14	42380.00	117.07	0.30 ( 0.29)	0.98	53621.7	11201.00
15	41937.30	122.03	0.30 ( 0.29)	0.98	55351.4	12201.00
16	40920.70	129.07	0.30 ( 0.29)	0.98	57206.8	12231.00
17	39631.05	136.87	0.30 ( 0.29)	0.98	58843.2	10400.00
18	38291.70	144.79	0.30 ( 0.29)	0.98	60137.7	12010.00
19	37124.16	150.75	0.30 ( 0.29)	0.98	60486.4	10210.00
20	32993.59	178.88	0.30 ( 0.29)	0.98	61224.6	10100.00

TOTAL AREA (ACRES) = 61224.6

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FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 14.0

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>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
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MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	27700.84	26.62	0.30 ( 0.29)	0.97	7227.0	30600.00
2	30694.90	34.60	0.30 ( 0.29)	0.97	10375.3	30200.00
3	32252.10	39.02	0.30 ( 0.29)	0.97	12357.5	30110.00
4	33538.32	43.09	0.30 ( 0.29)	0.97	14488.8	21400.00
5	34782.83	48.89	0.30 ( 0.29)	0.97	17407.2	31400.00
6	36638.21	59.11	0.30 ( 0.29)	0.96	22369.2	13100.00
7	37445.36	66.24	0.30 ( 0.29)	0.96	25294.4	11801.00
8	39010.07	77.02	0.30 ( 0.29)	0.97	30408.5	11530.00
9	39902.78	81.38	0.30 ( 0.29)	0.97	32942.5	11701.00
10	41064.37	86.68	0.30 ( 0.29)	0.97	36416.1	13010.00
11	42808.28	94.97	0.30 ( 0.29)	0.97	41898.1	10800.00
12	43317.02	99.20	0.30 ( 0.29)	0.97	44840.8	11130.00
13	42975.27	108.79	0.30 ( 0.29)	0.98	49879.6	12410.00
14	42380.00	117.07	0.30 ( 0.29)	0.98	53621.7	11201.00
15	41937.30	122.03	0.30 ( 0.29)	0.98	55351.4	12201.00
16	40920.70	129.07	0.30 ( 0.29)	0.98	57206.8	12231.00
17	39631.05	136.87	0.30 ( 0.29)	0.98	58843.2	10400.00
18	38291.70	144.79	0.30 ( 0.29)	0.98	60137.7	12010.00



19 37124.16 150.75 0.30( 0.29) 0.98 60486.4 10210.00  
 20 32993.59 178.88 0.30( 0.29) 0.98 61224.6 10100.00  
 TOTAL AREA (ACRES) = 61224.6

\*\*\*\*\*

FLOW PROCESS FROM NODE 13308.00 TO NODE 13402.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 212.00 DOWNSTREAM(FEET) = 209.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 623.02 CHANNEL SLOPE = 0.0048  
 GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 11.24  
 CHANNEL FLOW THRU SUBAREA(CFS) = 43317.02  
 FLOW VELOCITY(FEET/SEC.) = 15.04 FLOW DEPTH(FEET) = 11.24  
 TRAVEL TIME(MIN.) = 0.69 Tc(MIN.) = 99.89  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13402.00 = 118713.68 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	27700.84	27.41	1.813	0.30( 0.29)	0.97	7227.0	30600.00
2	30694.90	35.37	1.574	0.30( 0.29)	0.97	10375.3	30200.00
3	32252.10	39.77	1.459	0.30( 0.29)	0.97	12357.5	30110.00
4	33538.32	43.84	1.391	0.30( 0.29)	0.97	14488.8	21400.00
5	34782.83	49.63	1.297	0.30( 0.29)	0.97	17407.2	31400.00
6	36638.21	59.84	1.184	0.30( 0.29)	0.96	22369.2	13100.00
7	37445.36	66.97	1.135	0.30( 0.29)	0.96	25294.4	11801.00
8	39010.07	77.73	1.062	0.30( 0.29)	0.97	30408.5	11530.00
9	39902.78	82.09	1.033	0.30( 0.29)	0.97	32942.5	11701.00
10	41064.37	87.38	0.997	0.30( 0.29)	0.97	36416.1	13010.00
11	42808.28	95.66	0.954	0.30( 0.29)	0.97	41898.1	10800.00
12	43317.02	99.89	0.936	0.30( 0.29)	0.97	44840.8	11130.00
13	42975.27	109.48	0.895	0.30( 0.29)	0.98	49879.6	12410.00
14	42380.00	117.77	0.859	0.30( 0.29)	0.98	53621.7	11201.00
15	41937.30	122.73	0.843	0.30( 0.29)	0.98	55351.4	12201.00
16	40920.70	129.77	0.829	0.30( 0.29)	0.98	57206.8	12231.00
17	39631.05	137.58	0.813	0.30( 0.29)	0.98	58843.2	10400.00
18	38291.70	145.51	0.796	0.30( 0.29)	0.98	60137.7	12010.00
19	37124.16	151.48	0.784	0.30( 0.29)	0.98	60486.4	10210.00
20	32993.59	179.63	0.726	0.30( 0.29)	0.98	61224.6	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 43317.02 Tc(MIN.) = 99.89  
 AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 44840.84

\*\*\*\*\*

FLOW PROCESS FROM NODE 13402.00 TO NODE 13402.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610505X.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	265.16	19.79	0.30( 0.30)	0.99	153.2	50500.00

TOTAL AREA(ACRES) = 153.2

\*\*\*\*\*

FLOW PROCESS FROM NODE 13402.00 TO NODE 13402.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	27700.84	27.41	1.813	0.30( 0.29)	0.97	7227.0	30600.00
2	30694.90	35.37	1.574	0.30( 0.29)	0.97	10375.3	30200.00
3	32252.10	39.77	1.459	0.30( 0.29)	0.97	12357.5	30110.00
4	33538.32	43.84	1.391	0.30( 0.29)	0.97	14488.8	21400.00
5	34782.83	49.63	1.297	0.30( 0.29)	0.97	17407.2	31400.00
6	36638.21	59.84	1.184	0.30( 0.29)	0.96	22369.2	13100.00
7	37445.36	66.97	1.135	0.30( 0.29)	0.96	25294.4	11801.00
8	39010.07	77.73	1.062	0.30( 0.29)	0.97	30408.5	11530.00
9	39902.78	82.09	1.033	0.30( 0.29)	0.97	32942.5	11701.00
10	41064.37	87.38	0.997	0.30( 0.29)	0.97	36416.1	13010.00
11	42808.28	95.66	0.954	0.30( 0.29)	0.97	41898.1	10800.00
12	43317.02	99.89	0.936	0.30( 0.29)	0.97	44840.8	11130.00
13	42975.27	109.48	0.895	0.30( 0.29)	0.98	49879.6	12410.00
14	42380.00	117.77	0.859	0.30( 0.29)	0.98	53621.7	11201.00
15	41937.30	122.73	0.843	0.30( 0.29)	0.98	55351.4	12201.00
16	40920.70	129.77	0.829	0.30( 0.29)	0.98	57206.8	12231.00
17	39631.05	137.58	0.813	0.30( 0.29)	0.98	58843.2	10400.00
18	38291.70	145.51	0.796	0.30( 0.29)	0.98	60137.7	12010.00
19	37124.16	151.48	0.784	0.30( 0.29)	0.98	60486.4	10210.00
20	32993.59	179.63	0.726	0.30( 0.29)	0.98	61224.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13402.00 = 118713.68 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	265.16	19.79	2.219	0.30( 0.30)	0.99	153.2	50500.00

LONGEST FLOWPATH FROM NODE 50500.00 TO NODE 13402.00 = 6247.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25594.69	19.79	2.219	0.30( 0.29)	0.97	5369.2	50500.00
2	27910.03	27.41	1.813	0.30( 0.29)	0.97	7380.2	30600.00
3	30871.06	35.37	1.574	0.30( 0.29)	0.97	10528.5	30200.00
4	32412.42	39.77	1.459	0.30( 0.29)	0.97	12510.7	30110.00
5	33689.27	43.84	1.391	0.30( 0.29)	0.97	14642.0	21400.00
6	34920.84	49.63	1.297	0.30( 0.29)	0.97	17560.4	31400.00
7	36760.61	59.84	1.184	0.30( 0.29)	0.96	22522.4	13100.00
8	37561.02	66.97	1.135	0.30( 0.29)	0.96	25447.6	11801.00
9	39115.69	77.73	1.062	0.30( 0.29)	0.97	30561.7	11530.00
10	40004.34	82.09	1.033	0.30( 0.29)	0.97	33095.7	11701.00
11	41160.98	87.38	0.997	0.30( 0.29)	0.97	36569.3	13010.00
12	42899.07	95.66	0.954	0.30( 0.29)	0.97	42051.3	10800.00
13	43405.28	99.89	0.936	0.30( 0.29)	0.97	44994.0	11130.00
14	43057.80	109.48	0.895	0.30( 0.29)	0.98	50032.8	12410.00
15	42457.59	117.77	0.859	0.30( 0.29)	0.98	53774.9	11201.00
16	42012.77	122.73	0.843	0.30( 0.29)	0.98	55504.6	12201.00

17 40994.18 129.77 0.829 0.30( 0.29) 0.98 57360.0 12231.00  
 18 39702.29 137.58 0.813 0.30( 0.29) 0.98 58996.4 10400.00  
 19 38360.69 145.51 0.796 0.30( 0.29) 0.98 60290.9 12010.00  
 20 37191.45 151.48 0.784 0.30( 0.29) 0.98 60639.6 10210.00  
 21 33052.85 179.63 0.726 0.30( 0.29) 0.98 61377.8 10100.00  
 TOTAL AREA (ACRES) = 61377.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 43405.28 Tc(MIN.) = 99.891  
 EFFECTIVE AREA(ACRES) = 44994.02 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 61377.8  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13402.00 = 118713.68 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13402.00 TO NODE 13404.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 209.00 DOWNSTREAM(FEET) = 207.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 395.35 CHANNEL SLOPE = 0.0051  
 GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 11.10  
 CHANNEL FLOW THRU SUBAREA(CFS) = 43405.28  
 FLOW VELOCITY(FEET/SEC.) = 15.31 FLOW DEPTH(FEET) = 11.10  
 TRAVEL TIME(MIN.) = 0.43 Tc(MIN.) = 100.32  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13404.00 = 119109.03 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25594.69	20.30	2.183	0.30( 0.29)	0.97	5369.2	50500.00
2	27910.03	27.91	1.794	0.30( 0.29)	0.97	7380.2	30600.00
3	30871.06	35.86	1.561	0.30( 0.29)	0.97	10528.5	30200.00
4	32412.42	40.25	1.449	0.30( 0.29)	0.97	12510.7	30110.00
5	33689.27	44.31	1.383	0.30( 0.29)	0.97	14642.0	21400.00
6	34920.84	50.09	1.290	0.30( 0.29)	0.97	17560.4	31400.00
7	36760.61	60.30	1.180	0.30( 0.29)	0.96	22522.4	13100.00
8	37561.02	67.42	1.132	0.30( 0.29)	0.96	25447.6	11801.00
9	39115.69	78.18	1.059	0.30( 0.29)	0.97	30561.7	11530.00
10	40004.34	82.53	1.030	0.30( 0.29)	0.97	33095.7	11701.00
11	41160.98	87.82	0.994	0.30( 0.29)	0.97	36569.3	13010.00
12	42899.07	96.10	0.953	0.30( 0.29)	0.97	42051.3	10800.00
13	43405.28	100.32	0.934	0.30( 0.29)	0.97	44994.0	11130.00
14	43057.80	109.91	0.893	0.30( 0.29)	0.98	50032.8	12410.00
15	42457.59	118.20	0.857	0.30( 0.29)	0.98	53774.9	11201.00
16	42012.77	123.16	0.842	0.30( 0.29)	0.98	55504.6	12201.00
17	40994.18	130.21	0.828	0.30( 0.29)	0.98	57360.0	12231.00
18	39702.29	138.02	0.812	0.30( 0.29)	0.98	58996.4	10400.00
19	38360.69	145.95	0.795	0.30( 0.29)	0.98	60290.9	12010.00
20	37191.45	151.93	0.783	0.30( 0.29)	0.98	60639.6	10210.00
21	33052.85	180.10	0.725	0.30( 0.29)	0.98	61377.8	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 43405.28 Tc(MIN.) = 100.32  
 AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 44994.02

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13404.00 TO NODE 13404.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 3 <<<<<  
 =====

PEAK FLOWRATE TABLE FILE NAME: 0610506X.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	94.69	17.43	0.30( 0.30)	1.00	49.6	50600.00
TOTAL AREA(ACRES) = 49.6						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13404.00 TO NODE 13404.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<  
 =====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25594.69	20.30	2.183	0.30( 0.29)	0.97	5369.2	50500.00
2	27910.03	27.91	1.794	0.30( 0.29)	0.97	7380.2	30600.00
3	30871.06	35.86	1.561	0.30( 0.29)	0.97	10528.5	30200.00
4	32412.42	40.25	1.449	0.30( 0.29)	0.97	12510.7	30110.00
5	33689.27	44.31	1.383	0.30( 0.29)	0.97	14642.0	21400.00
6	34920.84	50.09	1.290	0.30( 0.29)	0.97	17560.4	31400.00
7	36760.61	60.30	1.180	0.30( 0.29)	0.96	22522.4	13100.00
8	37561.02	67.42	1.132	0.30( 0.29)	0.96	25447.6	11801.00
9	39115.69	78.18	1.059	0.30( 0.29)	0.97	30561.7	11530.00
10	40004.34	82.53	1.030	0.30( 0.29)	0.97	33095.7	11701.00
11	41160.98	87.82	0.994	0.30( 0.29)	0.97	36569.3	13010.00
12	42899.07	96.10	0.953	0.30( 0.29)	0.97	42051.3	10800.00
13	43405.28	100.32	0.934	0.30( 0.29)	0.97	44994.0	11130.00
14	43057.80	109.91	0.893	0.30( 0.29)	0.98	50032.8	12410.00
15	42457.59	118.20	0.857	0.30( 0.29)	0.98	53774.9	11201.00
16	42012.77	123.16	0.842	0.30( 0.29)	0.98	55504.6	12201.00
17	40994.18	130.21	0.828	0.30( 0.29)	0.98	57360.0	12231.00
18	39702.29	138.02	0.812	0.30( 0.29)	0.98	58996.4	10400.00
19	38360.69	145.95	0.795	0.30( 0.29)	0.98	60290.9	12010.00
20	37191.45	151.93	0.783	0.30( 0.29)	0.98	60639.6	10210.00
21	33052.85	180.10	0.725	0.30( 0.29)	0.98	61377.8	10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13404.00 = 119109.03 FEET.							

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	94.69	17.43	2.421	0.30( 0.30)	1.00	49.6	50600.00
LONGEST FLOWPATH FROM NODE 50600.00 TO NODE 13404.00 = 4378.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24840.38	17.43	2.421	0.30( 0.29)	0.97	4660.5	50600.00
2	25678.76	20.30	2.183	0.30( 0.29)	0.97	5418.8	50500.00
3	27976.72	27.91	1.794	0.30( 0.29)	0.97	7429.8	30600.00
4	30927.35	35.86	1.561	0.30( 0.29)	0.97	10578.1	30200.00

5	32463.71	40.25	1.449	0.30 ( 0.29)	0.97	12560.3	30110.00
6	33737.62	44.31	1.383	0.30 ( 0.29)	0.97	14691.6	21400.00
7	34965.02	50.09	1.290	0.30 ( 0.29)	0.97	17610.0	31400.00
8	36799.88	60.30	1.180	0.30 ( 0.29)	0.96	22572.0	13100.00
9	37598.15	67.42	1.132	0.30 ( 0.29)	0.96	25497.2	11801.00
10	39149.57	78.18	1.059	0.30 ( 0.29)	0.97	30611.3	11530.00
11	40036.90	82.53	1.030	0.30 ( 0.29)	0.97	33145.3	11701.00
12	41191.95	87.82	0.994	0.30 ( 0.29)	0.97	36618.9	13010.00
13	42928.20	96.10	0.953	0.30 ( 0.29)	0.97	42100.9	10800.00
14	43433.59	100.32	0.934	0.30 ( 0.29)	0.97	45043.6	11130.00
15	43084.26	109.91	0.893	0.30 ( 0.29)	0.98	50082.4	12410.00
16	42482.45	118.20	0.857	0.30 ( 0.29)	0.98	53824.5	11201.00
17	42036.99	123.16	0.842	0.30 ( 0.29)	0.98	55554.2	12201.00
18	41017.74	130.21	0.828	0.30 ( 0.29)	0.98	57409.6	12231.00
19	39725.14	138.02	0.812	0.30 ( 0.29)	0.98	59046.0	10400.00
20	38382.80	145.95	0.795	0.30 ( 0.29)	0.98	60340.5	12010.00
21	37213.00	151.93	0.783	0.30 ( 0.29)	0.98	60689.2	10210.00
22	33071.82	180.10	0.725	0.30 ( 0.29)	0.98	61427.4	10100.00

TOTAL AREA (ACRES) = 61427.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 43433.59 Tc(MIN.) = 100.321  
EFFECTIVE AREA(ACRES) = 45043.62 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA(ACRES) = 61427.4  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13404.00 = 119109.03 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13404.00 TO NODE 13406.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 207.00 DOWNSTREAM(FEET) = 195.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1601.97 CHANNEL SLOPE = 0.0075  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 9.94  
CHANNEL FLOW THRU SUBAREA(CFS) = 43433.59  
FLOW VELOCITY(FEET/SEC.) = 17.49 FLOW DEPTH(FEET) = 9.94  
TRAVEL TIME(MIN.) = 1.53 Tc(MIN.) = 101.85  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13406.00 = 120711.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24840.38	19.27	2.264	0.30 ( 0.29)	0.97	4660.5	50600.00
2	25678.76	22.11	2.076	0.30 ( 0.29)	0.97	5418.8	50500.00
3	27976.72	29.68	1.726	0.30 ( 0.29)	0.97	7429.8	30600.00
4	30927.35	37.56	1.517	0.30 ( 0.29)	0.97	10578.1	30200.00
5	32463.71	41.93	1.422	0.30 ( 0.29)	0.97	12560.3	30110.00
6	33737.62	45.96	1.356	0.30 ( 0.29)	0.97	14691.6	21400.00
7	34965.02	51.73	1.272	0.30 ( 0.29)	0.97	17610.0	31400.00
8	36799.88	61.91	1.169	0.30 ( 0.29)	0.96	22572.0	13100.00
9	37598.15	69.02	1.121	0.30 ( 0.29)	0.96	25497.2	11801.00
10	39149.57	79.76	1.048	0.30 ( 0.29)	0.97	30611.3	11530.00
11	40036.90	84.10	1.019	0.30 ( 0.29)	0.97	33145.3	11701.00
12	41191.95	89.38	0.983	0.30 ( 0.29)	0.97	36618.9	13010.00

13	42928.20	97.63	0.946	0.30 ( 0.29)	0.97	42100.9	10800.00
14	43433.59	101.85	0.928	0.30 ( 0.29)	0.97	45043.6	11130.00
15	43084.26	111.44	0.886	0.30 ( 0.29)	0.98	50082.4	12410.00
16	42482.45	119.74	0.850	0.30 ( 0.29)	0.98	53824.5	11201.00
17	42036.99	124.70	0.839	0.30 ( 0.29)	0.98	55554.2	12201.00
18	41017.74	131.76	0.825	0.30 ( 0.29)	0.98	57409.6	12231.00
19	39725.14	139.59	0.809	0.30 ( 0.29)	0.98	59046.0	10400.00
20	38382.80	147.54	0.792	0.30 ( 0.29)	0.98	60340.5	12010.00
21	37213.00	153.53	0.780	0.30 ( 0.29)	0.98	60689.2	10210.00
22	33071.82	181.77	0.723	0.30 ( 0.29)	0.98	61427.4	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 43433.59 Tc(MIN.) = 101.85  
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 45043.62

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13406.00 TO NODE 13406.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13406.00 TO NODE 13406.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610211X.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	209.22	12.84	0.30 ( 0.30)	1.00	87.0	21100.00
TOTAL AREA(ACRES) = 87.0						

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13406.00 TO NODE 13406.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24840.38	19.27	2.264	0.30 ( 0.29)	0.97	4660.5	50600.00
2	25678.76	22.11	2.076	0.30 ( 0.29)	0.97	5418.8	50500.00
3	27976.72	29.68	1.726	0.30 ( 0.29)	0.97	7429.8	30600.00
4	30927.35	37.56	1.517	0.30 ( 0.29)	0.97	10578.1	30200.00
5	32463.71	41.93	1.422	0.30 ( 0.29)	0.97	12560.3	30110.00
6	33737.62	45.96	1.356	0.30 ( 0.29)	0.97	14691.6	21400.00
7	34965.02	51.73	1.272	0.30 ( 0.29)	0.97	17610.0	31400.00
8	36799.88	61.91	1.169	0.30 ( 0.29)	0.96	22572.0	13100.00
9	37598.15	69.02	1.121	0.30 ( 0.29)	0.96	25497.2	11801.00
10	39149.57	79.76	1.048	0.30 ( 0.29)	0.97	30611.3	11530.00
11	40036.90	84.10	1.019	0.30 ( 0.29)	0.97	33145.3	11701.00
12	41191.95	89.38	0.983	0.30 ( 0.29)	0.97	36618.9	13010.00
13	42928.20	97.63	0.946	0.30 ( 0.29)	0.97	42100.9	10800.00
14	43433.59	101.85	0.928	0.30 ( 0.29)	0.97	45043.6	11130.00
15	43084.26	111.44	0.886	0.30 ( 0.29)	0.98	50082.4	12410.00
16	42482.45	119.74	0.850	0.30 ( 0.29)	0.98	53824.5	11201.00

17	42036.99	124.70	0.839	0.30( 0.29)	0.98	55554.2	12201.00
18	41017.74	131.76	0.825	0.30( 0.29)	0.98	57409.6	12231.00
19	39725.14	139.59	0.809	0.30( 0.29)	0.98	59046.0	10400.00
20	38382.80	147.54	0.792	0.30( 0.29)	0.98	60340.5	12010.00
21	37213.00	153.53	0.780	0.30( 0.29)	0.98	60689.2	10210.00
22	33071.82	181.77	0.723	0.30( 0.29)	0.98	61427.4	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13406.00 = 120711.00 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	209.22	12.84	2.972	0.30( 0.30)	1.00	87.0	21100.00

LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 13406.00 = 2859.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22709.72	12.84	2.972	0.30( 0.29)	0.98	3192.7	21100.00
2	24994.14	19.27	2.264	0.30( 0.29)	0.97	4747.5	50600.00
3	25817.83	22.11	2.076	0.30( 0.29)	0.97	5505.8	50500.00
4	28088.40	29.68	1.726	0.30( 0.29)	0.97	7516.8	30600.00
5	31022.61	37.56	1.517	0.30( 0.29)	0.97	10665.1	30200.00
6	32551.54	41.93	1.422	0.30( 0.29)	0.97	12647.3	30110.00
7	33820.33	45.96	1.356	0.30( 0.29)	0.97	14778.6	21400.00
8	35041.14	51.73	1.272	0.30( 0.29)	0.97	17697.0	31400.00
9	36867.93	61.91	1.169	0.30( 0.29)	0.96	22659.0	13100.00
10	37662.43	69.02	1.121	0.30( 0.29)	0.96	25584.2	11801.00
11	39208.16	79.76	1.048	0.30( 0.29)	0.97	30698.3	11530.00
12	40093.19	84.10	1.019	0.30( 0.29)	0.97	33232.3	11701.00
13	41245.45	89.38	0.983	0.30( 0.29)	0.97	36705.9	13010.00
14	42978.78	97.63	0.946	0.30( 0.29)	0.97	42187.9	10800.00
15	43482.74	101.85	0.928	0.30( 0.29)	0.97	45130.6	11130.00
16	43130.15	111.44	0.886	0.30( 0.29)	0.98	50169.4	12410.00
17	42525.52	119.74	0.850	0.30( 0.29)	0.98	53911.5	11201.00
18	42079.21	124.70	0.839	0.30( 0.29)	0.98	55641.2	12201.00
19	41058.82	131.76	0.825	0.30( 0.29)	0.98	57496.6	12231.00
20	39764.95	139.59	0.809	0.30( 0.29)	0.98	59133.0	10400.00
21	38421.34	147.54	0.792	0.30( 0.29)	0.98	60427.5	12010.00
22	37250.57	153.53	0.780	0.30( 0.29)	0.98	60776.2	10210.00
23	33104.95	181.77	0.723	0.30( 0.29)	0.98	61514.4	10100.00

TOTAL AREA (ACRES) = 61514.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 43482.74 Tc (MIN.) = 101.847  
EFFECTIVE AREA (ACRES) = 45130.62 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA (ACRES) = 61514.4  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13406.00 = 120711.00 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13406.00 TO NODE 13408.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 195.00 DOWNSTREAM (FEET) = 182.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2458.36 CHANNEL SLOPE = 0.0053  
GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT (FEET) = 10.97

\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 0.916

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	12.41	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 43486.18

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 15.55

AVERAGE FLOW DEPTH (FEET) = 10.97 TRAVEL TIME (MIN.) = 2.64

Tc (MIN.) = 104.48

SUBAREA AREA (ACRES) = 12.41 SUBAREA RUNOFF (CFS) = 6.88

EFFECTIVE AREA (ACRES) = 45143.03 AREA-AVERAGED Fm (INCH/HR) = 0.29

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97

TOTAL AREA (ACRES) = 61526.8 PEAK FLOW RATE (CFS) = 43482.74

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT (FEET) = 10.97

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 10.97 FLOW VELOCITY (FEET/SEC.) = 15.55

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13408.00 = 123169.36 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22709.72	16.10	2.536	0.30( 0.29)	0.98	3205.1	21100.00
2	24994.14	22.42	2.058	0.30( 0.29)	0.97	4759.9	50600.00
3	25817.83	25.24	1.897	0.30( 0.29)	0.97	5518.2	50500.00
4	28088.40	32.71	1.643	0.30( 0.29)	0.97	7529.2	30600.00
5	31022.61	40.50	1.445	0.30( 0.29)	0.97	10677.5	30200.00
6	32551.54	44.82	1.375	0.30( 0.29)	0.97	12659.7	30110.00
7	33820.33	48.82	1.310	0.30( 0.29)	0.97	14791.0	21400.00
8	35041.14	54.56	1.241	0.30( 0.29)	0.97	17709.4	31400.00
9	36867.93	64.69	1.150	0.30( 0.29)	0.96	22671.4	13100.00
10	37662.43	71.78	1.102	0.30( 0.29)	0.96	25596.6	11801.00
11	39208.16	82.48	1.030	0.30( 0.29)	0.97	30710.7	11530.00
12	40093.19	86.80	1.001	0.30( 0.29)	0.97	33244.7	11701.00
13	41245.45	92.06	0.970	0.30( 0.29)	0.97	36718.3	13010.00
14	42978.78	100.28	0.934	0.30( 0.29)	0.97	42200.3	10800.00
15	43482.74	104.48	0.916	0.30( 0.29)	0.97	45143.0	11130.00
16	43130.15	114.08	0.875	0.30( 0.29)	0.98	50181.8	12410.00
17	42525.52	122.39	0.844	0.30( 0.29)	0.98	53923.9	11201.00
18	42079.21	127.37	0.834	0.30( 0.29)	0.98	55653.6	12201.00
19	41058.82	134.45	0.819	0.30( 0.29)	0.98	57509.0	12231.00
20	39764.95	142.30	0.803	0.30( 0.29)	0.98	59145.4	10400.00
21	38421.34	150.28	0.786	0.30( 0.29)	0.98	60439.9	12010.00
22	37250.57	156.30	0.774	0.30( 0.29)	0.98	60788.6	10210.00
23	33104.95	184.65	0.720	0.30( 0.29)	0.98	61526.8	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 43482.74 Tc (MIN.) = 104.48

AREA-AVERAGED Fm (INCH/HR) = 0.29 AREA-AVERAGED Fp (INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA (ACRES) = 45143.03

\*\*\*\*\*

FLOW PROCESS FROM NODE 13408.00 TO NODE 13408.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13408.00 TO NODE 13408.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610507X.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	406.61	19.94	0.30	(0.30)	0.99	236.8	50700.00
TOTAL AREA (ACRES) =							236.8

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13408.00 TO NODE 13408.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22709.72	16.10	2.536	0.30 (0.29)	0.98	3205.1	21100.00
2	24994.14	22.42	2.058	0.30 (0.29)	0.97	4759.9	50600.00
3	25817.83	25.24	1.897	0.30 (0.29)	0.97	5518.2	50500.00
4	28088.40	32.71	1.643	0.30 (0.29)	0.97	7529.2	30600.00
5	31022.61	40.50	1.445	0.30 (0.29)	0.97	10677.5	30200.00
6	32551.54	44.82	1.375	0.30 (0.29)	0.97	12659.7	30110.00
7	33820.33	48.82	1.310	0.30 (0.29)	0.97	14791.0	21400.00
8	35041.14	54.56	1.241	0.30 (0.29)	0.97	17709.4	31400.00
9	36867.93	64.69	1.150	0.30 (0.29)	0.96	22671.4	13100.00
10	37662.43	71.78	1.102	0.30 (0.29)	0.96	25596.6	11801.00
11	39208.16	82.48	1.030	0.30 (0.29)	0.97	30710.7	11530.00
12	40093.19	86.80	1.001	0.30 (0.29)	0.97	33244.7	11701.00
13	41245.45	92.06	0.970	0.30 (0.29)	0.97	36718.3	13010.00
14	42978.78	100.28	0.934	0.30 (0.29)	0.97	42200.3	10800.00
15	43482.74	104.48	0.916	0.30 (0.29)	0.97	45143.0	11130.00
16	43130.15	114.08	0.875	0.30 (0.29)	0.98	50181.8	12410.00
17	42525.52	122.39	0.844	0.30 (0.29)	0.98	53923.9	11201.00
18	42079.21	127.37	0.834	0.30 (0.29)	0.98	55653.6	12201.00
19	41058.82	134.45	0.819	0.30 (0.29)	0.98	57509.0	12231.00
20	39764.95	142.30	0.803	0.30 (0.29)	0.98	59145.4	10400.00
21	38421.34	150.28	0.786	0.30 (0.29)	0.98	60439.9	12010.00
22	37250.57	156.30	0.774	0.30 (0.29)	0.98	60788.6	10210.00
23	33104.95	184.65	0.720	0.30 (0.29)	0.98	61526.8	10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13408.00 =							123169.36 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	406.61	19.94	2.206	0.30 (0.30)	0.99	236.8	50700.00
LONGEST FLOWPATH FROM NODE 50700.00 TO NODE 13408.00 =							7903.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23094.70	16.10	2.536	0.30 (0.29)	0.98	3396.3	21100.00
2	24504.60	19.94	2.206	0.30 (0.29)	0.98	4386.8	50700.00
3	25369.23	22.42	2.058	0.30 (0.29)	0.98	4996.7	50600.00
4	26158.60	25.24	1.897	0.30 (0.29)	0.98	5755.0	50500.00
5	28375.10	32.71	1.643	0.30 (0.29)	0.98	7766.0	30600.00
6	31267.06	40.50	1.445	0.30 (0.29)	0.97	10914.3	30200.00
7	32781.07	44.82	1.375	0.30 (0.29)	0.97	12896.5	30110.00
8	34036.06	48.82	1.310	0.30 (0.29)	0.97	15027.8	21400.00
9	35242.21	54.56	1.241	0.30 (0.29)	0.97	17946.2	31400.00
10	37049.60	64.69	1.150	0.30 (0.29)	0.96	22908.2	13100.00
11	37833.88	71.78	1.102	0.30 (0.29)	0.96	25833.4	11801.00
12	39364.17	82.48	1.030	0.30 (0.29)	0.97	30947.5	11530.00
13	40242.98	86.80	1.001	0.30 (0.29)	0.97	33481.5	11701.00
14	41388.72	92.06	0.970	0.30 (0.29)	0.97	36955.1	13010.00
15	43114.46	100.28	0.934	0.30 (0.29)	0.97	42437.1	10800.00
16	43614.54	104.48	0.916	0.30 (0.29)	0.97	45379.8	11130.00
17	43253.09	114.08	0.875	0.30 (0.29)	0.98	50418.6	12410.00
18	42641.94	122.39	0.844	0.30 (0.29)	0.98	54160.7	11201.00
19	42193.44	127.37	0.834	0.30 (0.29)	0.98	55890.4	12201.00
20	41169.93	134.45	0.819	0.30 (0.29)	0.98	57745.8	12231.00
21	39872.60	142.30	0.803	0.30 (0.29)	0.98	59382.2	10400.00
22	38525.47	150.28	0.786	0.30 (0.29)	0.98	60676.7	12010.00
23	37352.05	156.30	0.774	0.30 (0.29)	0.98	61025.4	10210.00
24	33194.95	184.65	0.720	0.30 (0.29)	0.98	61763.6	10100.00
TOTAL AREA (ACRES) =							61763.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 43614.54 Tc (MIN.) = 104.483  
EFFECTIVE AREA (ACRES) = 45379.82 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA (ACRES) = 61763.6  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13408.00 = 123169.36 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13408.00 TO NODE 13410.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 182.00 DOWNSTREAM (FEET) = 178.72  
CHANNEL LENGTH THRU SUBAREA (FEET) = 952.73 CHANNEL SLOPE = 0.0034  
GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 12.39  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 0.911  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	3.31	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 43615.45  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 13.44  
AVERAGE FLOW DEPTH (FEET) = 12.39 TRAVEL TIME (MIN.) = 1.18  
Tc (MIN.) = 105.66  
SUBAREA AREA (ACRES) = 3.31 SUBAREA RUNOFF (CFS) = 1.82

EFFECTIVE AREA(ACRES) = 45383.12 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 61766.9 PEAK FLOW RATE(CFS) = 43614.54  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 12.39

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 12.39 FLOW VELOCITY(FEET/SEC.) = 13.44  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13410.00 = 124122.09 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23094.70	17.55	2.411	0.30( 0.29)	0.98	3399.6	21100.00
2	24504.60	21.36	2.120	0.30( 0.29)	0.98	4390.1	50700.00
3	25369.23	23.83	1.975	0.30( 0.29)	0.98	5000.0	50600.00
4	26158.60	26.63	1.843	0.30( 0.29)	0.98	5758.3	50500.00
5	28375.10	34.07	1.608	0.30( 0.29)	0.98	7769.3	30600.00
6	31267.06	41.82	1.424	0.30( 0.29)	0.97	10917.6	30200.00
7	32781.07	46.12	1.354	0.30( 0.29)	0.97	12899.8	30110.00
8	34036.06	50.10	1.290	0.30( 0.29)	0.97	15031.1	21400.00
9	35242.21	55.82	1.228	0.30( 0.29)	0.97	17949.5	31400.00
10	37049.60	65.93	1.142	0.30( 0.29)	0.96	22911.5	13100.00
11	37833.88	73.01	1.094	0.30( 0.29)	0.96	25836.7	11801.00
12	39364.17	83.70	1.022	0.30( 0.29)	0.97	30950.8	11530.00
13	40242.98	88.01	0.992	0.30( 0.29)	0.97	33484.8	11701.00
14	41388.72	93.26	0.965	0.30( 0.29)	0.97	36958.4	13010.00
15	43114.46	101.46	0.929	0.30( 0.29)	0.97	42440.4	10800.00
16	43614.54	105.66	0.911	0.30( 0.29)	0.97	45383.1	11130.00
17	43253.09	115.27	0.870	0.30( 0.29)	0.98	50421.9	12410.00
18	42641.94	123.58	0.842	0.30( 0.29)	0.98	54164.0	11201.00
19	42193.44	128.56	0.831	0.30( 0.29)	0.98	55893.7	12201.00
20	41169.93	135.65	0.817	0.30( 0.29)	0.98	57749.1	12231.00
21	39872.60	143.52	0.800	0.30( 0.29)	0.98	59385.5	10400.00
22	38525.47	151.51	0.784	0.30( 0.29)	0.98	60680.0	12010.00
23	37352.05	157.54	0.771	0.30( 0.29)	0.98	61028.7	10210.00
24	33194.95	185.94	0.719	0.30( 0.29)	0.98	61766.9	10100.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 43614.54 Tc(MIN.) = 105.66  
 AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 45383.12

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 FLOW PROCESS FROM NODE 13410.00 TO NODE 13410.00 IS CODE = 12  
 -----  
 >>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13410.00 TO NODE 13410.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<  
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PEAK FLOWRATE TABLE FILE NAME: S36.DNA  
 MEMORY BANK # 3 DEFINED AS FOLLOWS:  
 STREAM Q Tc Fp(Fm) Ap Ae HEADWATER

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(ACRES)	NODE	
1	2910.65	20.44	0.30( 0.30)	0.99	1260.6	21000.00
2	2989.79	23.10	0.30( 0.30)	0.99	1445.3	20810.00
3	3003.85	23.43	0.30( 0.30)	0.99	1471.9	20900.00
4	3091.89	25.96	0.30( 0.30)	0.99	1661.5	20800.00
5	3097.72	27.72	0.30( 0.30)	0.99	1780.4	20700.00
6	3142.81	35.26	0.30( 0.30)	0.99	2292.7	20600.00
7	3137.40	40.67	0.30( 0.30)	0.99	2620.6	20500.00
8	3096.39	42.97	0.30( 0.30)	0.99	2721.6	20400.00
9	3088.42	43.38	0.30( 0.30)	0.99	2734.5	20300.00
10	3032.58	45.96	0.30( 0.30)	0.99	2812.8	20210.00
11	3031.11	46.05	0.30( 0.30)	0.99	2815.9	20200.00
12	2999.88	47.73	0.30( 0.30)	0.99	2872.0	20100.00
13	2891.88	52.36	0.30( 0.30)	0.98	3016.9	13600.00
14	2658.92	87.63	0.30( 0.29)	0.98	4003.4	13510.00
15	2501.00	96.53	0.30( 0.29)	0.97	4067.7	13500.00
TOTAL AREA(ACRES) =			4067.7			

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 FLOW PROCESS FROM NODE 13410.00 TO NODE 13410.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23094.70	17.55	2.411	0.30( 0.29)	0.98	3399.6	21100.00
2	24504.60	21.36	2.120	0.30( 0.29)	0.98	4390.1	50700.00
3	25369.23	23.83	1.975	0.30( 0.29)	0.98	5000.0	50600.00
4	26158.60	26.63	1.843	0.30( 0.29)	0.98	5758.3	50500.00
5	28375.10	34.07	1.608	0.30( 0.29)	0.98	7769.3	30600.00
6	31267.06	41.82	1.424	0.30( 0.29)	0.97	10917.6	30200.00
7	32781.07	46.12	1.354	0.30( 0.29)	0.97	12899.8	30110.00
8	34036.06	50.10	1.290	0.30( 0.29)	0.97	15031.1	21400.00
9	35242.21	55.82	1.228	0.30( 0.29)	0.97	17949.5	31400.00
10	37049.60	65.93	1.142	0.30( 0.29)	0.96	22911.5	13100.00
11	37833.88	73.01	1.094	0.30( 0.29)	0.96	25836.7	11801.00
12	39364.17	83.70	1.022	0.30( 0.29)	0.97	30950.8	11530.00
13	40242.98	88.01	0.992	0.30( 0.29)	0.97	33484.8	11701.00
14	41388.72	93.26	0.965	0.30( 0.29)	0.97	36958.4	13010.00
15	43114.46	101.46	0.929	0.30( 0.29)	0.97	42440.4	10800.00
16	43614.54	105.66	0.911	0.30( 0.29)	0.97	45383.1	11130.00
17	43253.09	115.27	0.870	0.30( 0.29)	0.98	50421.9	12410.00
18	42641.94	123.58	0.842	0.30( 0.29)	0.98	54164.0	11201.00
19	42193.44	128.56	0.831	0.30( 0.29)	0.98	55893.7	12201.00
20	41169.93	135.65	0.817	0.30( 0.29)	0.98	57749.1	12231.00
21	39872.60	143.52	0.800	0.30( 0.29)	0.98	59385.5	10400.00
22	38525.47	151.51	0.784	0.30( 0.29)	0.98	60680.0	12010.00
23	37352.05	157.54	0.771	0.30( 0.29)	0.98	61028.7	10210.00
24	33194.95	185.94	0.719	0.30( 0.29)	0.98	61766.9	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13410.00 = 124122.09 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2910.65	20.44	2.175	0.30( 0.30)	0.99	1260.6	21000.00
2	2989.79	23.10	2.018	0.30( 0.30)	0.99	1445.3	20810.00



32	45445.76	115.41	0.869	0.30 (0.29)	0.98	54489.6	12410.00
33	44728.61	123.72	0.841	0.30 (0.29)	0.98	58231.7	11201.00
34	44241.01	128.71	0.831	0.30 (0.29)	0.98	59961.4	12201.00
35	43161.86	135.80	0.816	0.30 (0.29)	0.98	61816.8	12231.00
36	41802.77	143.67	0.800	0.30 (0.29)	0.98	63453.2	10400.00
37	40392.89	151.66	0.784	0.30 (0.29)	0.98	64747.7	12010.00
38	39172.14	157.69	0.771	0.30 (0.29)	0.98	65096.4	10210.00
39	34814.85	186.09	0.719	0.30 (0.29)	0.98	65834.6	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 45965.25 Tc(MIN.) = 105.81  
 AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 49450.86

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13412.00 TO NODE 13412.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13412.00 TO NODE 13412.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0509101X.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	657.43	36.39	0.30 (0.30)	1.00	585.7	10100.00
TOTAL AREA(ACRES) = 585.7						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13412.00 TO NODE 13412.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25907.87	17.72	2.397	0.30 (0.29)	0.98	4481.8	21100.00
2	27074.21	20.61	2.165	0.30 (0.29)	0.98	5411.1	21000.00
3	27442.71	21.53	2.111	0.30 (0.29)	0.98	5714.8	50700.00
4	28103.40	23.27	2.008	0.30 (0.29)	0.98	6265.0	20810.00
5	28233.42	23.60	1.989	0.30 (0.29)	0.98	6373.4	20900.00
6	28386.95	24.00	1.965	0.30 (0.29)	0.98	6501.8	50600.00
7	29061.82	26.13	1.863	0.30 (0.29)	0.98	7238.6	20800.00
8	29252.71	26.79	1.837	0.30 (0.29)	0.98	7465.1	50500.00
9	29580.77	27.88	1.795	0.30 (0.29)	0.98	7833.2	20700.00
10	31510.77	34.23	1.604	0.30 (0.29)	0.98	9980.9	30600.00
11	31963.98	35.42	1.572	0.30 (0.29)	0.98	10547.6	20600.00
12	33974.88	40.82	1.440	0.30 (0.29)	0.98	13070.5	20500.00
13	34383.99	41.97	1.421	0.30 (0.29)	0.98	13588.6	30200.00
14	34770.10	43.13	1.402	0.30 (0.29)	0.98	14171.7	20400.00
15	34907.20	43.54	1.396	0.30 (0.29)	0.97	14374.5	20300.00
16	35758.63	46.11	1.354	0.30 (0.29)	0.97	15640.6	20210.00
17	35788.36	46.20	1.353	0.30 (0.29)	0.97	15684.6	20200.00
18	35810.93	46.27	1.351	0.30 (0.29)	0.97	15718.0	30110.00

19	36289.16	47.88	1.325	0.30 (0.29)	0.97	16634.9	20100.00
20	36980.67	50.25	1.288	0.30 (0.29)	0.97	17977.3	21400.00
21	37404.68	52.51	1.264	0.30 (0.29)	0.97	19201.5	13600.00
22	38111.24	55.97	1.226	0.30 (0.29)	0.97	21063.2	31400.00
23	39851.84	66.08	1.141	0.30 (0.29)	0.97	26308.0	13100.00
24	40589.35	73.16	1.093	0.30 (0.29)	0.97	29431.3	11801.00
25	42049.02	83.85	1.021	0.30 (0.29)	0.97	34844.4	11530.00
26	42823.44	87.77	0.994	0.30 (0.29)	0.97	37261.9	13510.00
27	42895.08	88.16	0.991	0.30 (0.29)	0.97	37491.0	11701.00
28	43947.80	93.40	0.964	0.30 (0.29)	0.97	41002.5	13010.00
29	44578.67	96.67	0.950	0.30 (0.29)	0.97	43214.6	13500.00
30	45534.35	101.60	0.929	0.30 (0.29)	0.97	46508.1	10800.00
31	45965.25	105.81	0.911	0.30 (0.29)	0.97	49450.9	11130.00
32	45445.76	115.41	0.869	0.30 (0.29)	0.98	54489.6	12410.00
33	44728.61	123.72	0.841	0.30 (0.29)	0.98	58231.7	11201.00
34	44241.01	128.71	0.831	0.30 (0.29)	0.98	59961.4	12201.00
35	43161.86	135.80	0.816	0.30 (0.29)	0.98	61816.8	12231.00
36	41802.77	143.67	0.800	0.30 (0.29)	0.98	63453.2	10400.00
37	40392.89	151.66	0.784	0.30 (0.29)	0.98	64747.7	12010.00
38	39172.14	157.69	0.771	0.30 (0.29)	0.98	65096.4	10210.00
39	34814.85	186.09	0.719	0.30 (0.29)	0.98	65834.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 124291.87 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	657.43	36.39	1.547	0.30 (0.30)	1.00	585.7	10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 14724.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26446.04	17.72	2.397	0.30 (0.29)	0.98	4767.1	21100.00
2	27631.00	20.61	2.165	0.30 (0.29)	0.98	5742.9	21000.00
3	28007.44	21.53	2.111	0.30 (0.29)	0.98	6061.4	50700.00
4	28679.13	23.27	2.008	0.30 (0.29)	0.98	6639.6	20810.00
5	28810.67	23.60	1.989	0.30 (0.29)	0.98	6753.3	20900.00
6	28965.77	24.00	1.965	0.30 (0.29)	0.98	6888.1	50600.00
7	29653.23	26.13	1.863	0.30 (0.29)	0.98	7659.2	20800.00
8	29849.29	26.79	1.837	0.30 (0.29)	0.98	7896.4	50500.00
9	30184.71	27.88	1.795	0.30 (0.29)	0.98	8282.0	20700.00
10	32157.15	34.23	1.604	0.30 (0.29)	0.98	10531.9	30600.00
11	32616.91	35.42	1.572	0.30 (0.29)	0.98	11117.8	20600.00
12	32979.48	36.39	1.547	0.30 (0.29)	0.98	11582.6	10100.00
13	34575.57	40.82	1.440	0.30 (0.29)	0.98	13656.2	20500.00
14	34974.87	41.97	1.421	0.30 (0.29)	0.98	14174.3	30200.00
15	35351.12	43.13	1.402	0.30 (0.29)	0.98	14757.4	20400.00
16	35484.70	43.54	1.396	0.30 (0.29)	0.98	14960.2	20300.00
17	36314.14	46.11	1.354	0.30 (0.29)	0.97	16226.3	20210.00
18	36343.12	46.20	1.353	0.30 (0.29)	0.97	16270.3	20200.00
19	36365.11	46.27	1.351	0.30 (0.29)	0.97	16303.7	30110.00
20	36829.58	47.88	1.325	0.30 (0.29)	0.97	17220.6	20100.00
21	37501.56	50.25	1.288	0.30 (0.29)	0.97	18563.0	21400.00
22	37912.58	52.51	1.264	0.30 (0.29)	0.97	19787.3	13600.00
23	38599.27	55.97	1.226	0.30 (0.29)	0.97	21648.9	31400.00
24	40295.04	66.08	1.141	0.30 (0.29)	0.97	26893.7	13100.00
25	41007.30	73.16	1.093	0.30 (0.29)	0.97	30017.0	11801.00
26	42428.84	83.85	1.021	0.30 (0.29)	0.97	35430.2	11530.00



27	43189.27	87.77	0.994	0.30	( 0.29)	0.97	37847.7	13510.00
28	43259.54	88.16	0.991	0.30	( 0.29)	0.97	38076.7	11701.00
29	44297.93	93.40	0.964	0.30	( 0.29)	0.97	41588.2	13010.00
30	44921.32	96.67	0.950	0.30	( 0.29)	0.97	43800.4	13500.00
31	45865.75	101.60	0.929	0.30	( 0.29)	0.97	47093.9	10800.00
32	46287.05	105.81	0.911	0.30	( 0.29)	0.97	50036.6	11130.00
33	45745.62	115.41	0.869	0.30	( 0.29)	0.98	55075.3	12410.00
34	45013.94	123.72	0.841	0.30	( 0.29)	0.98	58817.5	11201.00
35	44520.91	128.71	0.831	0.30	( 0.29)	0.98	60547.2	12201.00
36	43434.04	135.80	0.816	0.30	( 0.29)	0.98	62402.5	12231.00
37	42066.37	143.67	0.800	0.30	( 0.29)	0.98	64038.9	10400.00
38	40647.79	151.66	0.784	0.30	( 0.29)	0.98	65333.5	12010.00
39	39420.47	157.69	0.771	0.30	( 0.29)	0.98	65682.2	10210.00
40	35035.47	186.09	0.719	0.30	( 0.29)	0.98	66420.4	10100.00

TOTAL AREA (ACRES) = 66420.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 46287.05 Tc (MIN.) = 105.806  
EFFECTIVE AREA (ACRES) = 50036.59 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA (ACRES) = 66420.4  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 124291.87 FEET.

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FLOW PROCESS FROM NODE 13412.00 TO NODE 13700.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 176.93 DOWNSTREAM (FEET) = 173.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 260.10 CHANNEL SLOPE = 0.0151  
GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 8.45  
CHANNEL FLOW THRU SUBAREA (CFS) = 46287.05  
FLOW VELOCITY (FEET/SEC.) = 22.61 FLOW DEPTH (FEET) = 8.45  
TRAVEL TIME (MIN.) = 0.19 Tc (MIN.) = 106.00  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13700.00 = 124551.97 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26446.04	17.95	2.377	0.30 ( 0.29)	0.98	4767.1	21100.00
2	27631.00	20.84	2.152	0.30 ( 0.29)	0.98	5742.9	21000.00
3	28007.44	21.76	2.097	0.30 ( 0.29)	0.98	6061.4	50700.00
4	28679.13	23.49	1.995	0.30 ( 0.29)	0.98	6639.6	20810.00
5	28810.67	23.82	1.975	0.30 ( 0.29)	0.98	6753.3	20900.00
6	28965.77	24.22	1.952	0.30 ( 0.29)	0.98	6888.1	50600.00
7	29653.23	26.35	1.854	0.30 ( 0.29)	0.98	7659.2	20800.00
8	29849.29	27.02	1.829	0.30 ( 0.29)	0.98	7896.4	50500.00
9	30184.71	28.10	1.787	0.30 ( 0.29)	0.98	8282.0	20700.00
10	32157.15	34.45	1.598	0.30 ( 0.29)	0.98	10531.9	30600.00
11	32616.91	35.64	1.567	0.30 ( 0.29)	0.98	11117.8	20600.00
12	32979.48	36.60	1.542	0.30 ( 0.29)	0.98	11582.6	10100.00
13	34575.57	41.03	1.436	0.30 ( 0.29)	0.98	13656.2	20500.00
14	34974.87	42.18	1.418	0.30 ( 0.29)	0.98	14174.3	30200.00
15	35351.12	43.34	1.399	0.30 ( 0.29)	0.98	14757.4	20400.00
16	35484.70	43.75	1.392	0.30 ( 0.29)	0.98	14960.2	20300.00

17	36314.14	46.32	1.351	0.30	( 0.29)	0.97	16226.3	20210.00
18	36343.12	46.41	1.349	0.30	( 0.29)	0.97	16270.3	20200.00
19	36365.11	46.48	1.348	0.30	( 0.29)	0.97	16303.7	30110.00
20	36829.58	48.09	1.322	0.30	( 0.29)	0.97	17220.6	20100.00
21	37501.56	50.46	1.286	0.30	( 0.29)	0.97	18563.0	21400.00
22	37912.58	52.72	1.261	0.30	( 0.29)	0.97	19787.3	13600.00
23	38599.27	56.17	1.224	0.30	( 0.29)	0.97	21648.9	31400.00
24	40295.04	66.28	1.140	0.30	( 0.29)	0.97	26893.7	13100.00
25	41007.30	73.36	1.092	0.30	( 0.29)	0.97	30017.0	11801.00
26	42428.84	84.05	1.019	0.30	( 0.29)	0.97	35430.2	11530.00
27	43189.27	87.97	0.993	0.30	( 0.29)	0.97	37847.7	13510.00
28	43259.54	88.35	0.990	0.30	( 0.29)	0.97	38076.7	11701.00
29	44297.93	93.60	0.963	0.30	( 0.29)	0.97	41588.2	13010.00
30	44921.32	96.87	0.949	0.30	( 0.29)	0.97	43800.4	13500.00
31	45865.75	101.79	0.928	0.30	( 0.29)	0.97	47093.9	10800.00
32	46287.05	106.00	0.910	0.30	( 0.29)	0.97	50036.6	11130.00
33	45745.62	115.60	0.868	0.30	( 0.29)	0.98	55075.3	12410.00
34	45013.94	123.92	0.841	0.30	( 0.29)	0.98	58817.5	11201.00
35	44520.91	128.90	0.831	0.30	( 0.29)	0.98	60547.2	12201.00
36	43434.04	135.99	0.816	0.30	( 0.29)	0.98	62402.5	12231.00
37	42066.37	143.86	0.800	0.30	( 0.29)	0.98	64038.9	10400.00
38	40647.79	151.86	0.783	0.30	( 0.29)	0.98	65333.5	12010.00
39	39420.47	157.89	0.771	0.30	( 0.29)	0.98	65682.2	10210.00
40	35035.47	186.30	0.718	0.30	( 0.29)	0.98	66420.4	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 46287.05 Tc (MIN.) = 106.00  
AREA-AVERAGED Fm (INCH/HR) = 0.29 AREA-AVERAGED Fp (INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA (ACRES) = 50036.59

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FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<<

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FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610508X.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	219.66	20.77	0.30 ( 0.30)	0.99	131.3	50800.00

TOTAL AREA (ACRES) = 131.3

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FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26446.04	17.95	2.377	0.30 ( 0.29)	0.98	4767.1	21100.00
2	27631.00	20.84	2.152	0.30 ( 0.29)	0.98	5742.9	21000.00

3	28007.44	21.76	2.097	0.30 ( 0.29)	0.98	6061.4	50700.00
4	28679.13	23.49	1.995	0.30 ( 0.29)	0.98	6639.6	20810.00
5	28810.67	23.82	1.975	0.30 ( 0.29)	0.98	6753.3	20900.00
6	28965.77	24.22	1.952	0.30 ( 0.29)	0.98	6888.1	50600.00
7	29653.23	26.35	1.854	0.30 ( 0.29)	0.98	7659.2	20800.00
8	29849.29	27.02	1.829	0.30 ( 0.29)	0.98	7896.4	50500.00
9	30184.71	28.10	1.787	0.30 ( 0.29)	0.98	8282.0	20700.00
10	32157.15	34.45	1.598	0.30 ( 0.29)	0.98	10531.9	30600.00
11	32616.91	35.64	1.567	0.30 ( 0.29)	0.98	11117.8	20600.00
12	32979.48	36.60	1.542	0.30 ( 0.29)	0.98	11582.6	10100.00
13	34575.57	41.03	1.436	0.30 ( 0.29)	0.98	13656.2	20500.00
14	34974.87	42.18	1.418	0.30 ( 0.29)	0.98	14174.3	30200.00
15	35351.12	43.34	1.399	0.30 ( 0.29)	0.98	14757.4	20400.00
16	35484.70	43.75	1.392	0.30 ( 0.29)	0.98	14960.2	20300.00
17	36314.14	46.32	1.351	0.30 ( 0.29)	0.97	16226.3	20210.00
18	36343.12	46.41	1.349	0.30 ( 0.29)	0.97	16270.3	20200.00
19	36365.11	46.48	1.348	0.30 ( 0.29)	0.97	16303.7	30110.00
20	36829.58	48.09	1.322	0.30 ( 0.29)	0.97	17220.6	20100.00
21	37501.56	50.46	1.286	0.30 ( 0.29)	0.97	18563.0	21400.00
22	37912.58	52.72	1.261	0.30 ( 0.29)	0.97	19787.3	13600.00
23	38599.27	56.17	1.224	0.30 ( 0.29)	0.97	21648.9	31400.00
24	40295.04	66.28	1.140	0.30 ( 0.29)	0.97	26893.7	13100.00
25	41007.30	73.36	1.092	0.30 ( 0.29)	0.97	30017.0	11801.00
26	42428.84	84.05	1.019	0.30 ( 0.29)	0.97	35430.2	11530.00
27	43189.27	87.97	0.993	0.30 ( 0.29)	0.97	37847.7	13510.00
28	43259.54	88.35	0.990	0.30 ( 0.29)	0.97	38076.7	11701.00
29	44297.93	93.60	0.963	0.30 ( 0.29)	0.97	41588.2	13010.00
30	44921.32	96.87	0.949	0.30 ( 0.29)	0.97	43800.4	13500.00
31	45865.75	101.79	0.928	0.30 ( 0.29)	0.97	47093.9	10800.00
32	46287.05	106.00	0.910	0.30 ( 0.29)	0.97	50036.6	11130.00
33	45745.62	115.60	0.868	0.30 ( 0.29)	0.98	55075.3	12410.00
34	45013.94	123.92	0.841	0.30 ( 0.29)	0.98	58817.5	11201.00
35	44520.91	128.90	0.831	0.30 ( 0.29)	0.98	60547.2	12201.00
36	43434.04	135.99	0.816	0.30 ( 0.29)	0.98	62402.5	12231.00
37	42066.37	143.86	0.800	0.30 ( 0.29)	0.98	64038.9	10400.00
38	40647.79	151.86	0.783	0.30 ( 0.29)	0.98	65333.5	12010.00
39	39420.47	157.89	0.771	0.30 ( 0.29)	0.98	65682.2	10210.00
40	35035.47	186.30	0.718	0.30 ( 0.29)	0.98	66420.4	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13700.00 = 124551.97 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	219.66	20.77	2.156	0.30 ( 0.30)	0.99	131.3	50800.00

LONGEST FLOWPATH FROM NODE 50800.00 TO NODE 13700.00 = 5946.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26658.49	17.95	2.377	0.30 ( 0.29)	0.98	4880.6	21100.00
2	27820.78	20.77	2.156	0.30 ( 0.29)	0.98	5849.6	50800.00
3	27850.15	20.84	2.152	0.30 ( 0.29)	0.98	5874.2	21000.00
4	28220.17	21.76	2.097	0.30 ( 0.29)	0.98	6192.7	50700.00
5	28879.78	23.49	1.995	0.30 ( 0.29)	0.98	6770.8	20810.00
6	29009.01	23.82	1.975	0.30 ( 0.29)	0.98	6884.5	20900.00
7	29161.35	24.22	1.952	0.30 ( 0.29)	0.98	7019.4	50600.00
8	29837.27	26.35	1.854	0.30 ( 0.29)	0.98	7790.5	20800.00
9	30030.29	27.02	1.829	0.30 ( 0.29)	0.98	8027.7	50500.00

10	30360.77	28.10	1.787	0.30 ( 0.29)	0.98	8413.3	20700.00
11	32310.90	34.45	1.598	0.30 ( 0.29)	0.98	10663.2	30600.00
12	32766.98	35.64	1.567	0.30 ( 0.29)	0.98	11249.1	20600.00
13	33126.59	36.60	1.542	0.30 ( 0.29)	0.98	11713.8	10100.00
14	34710.22	41.03	1.436	0.30 ( 0.29)	0.98	13787.5	20500.00
15	35107.32	42.18	1.418	0.30 ( 0.29)	0.98	14305.6	30200.00
16	35481.37	43.34	1.399	0.30 ( 0.29)	0.98	14888.7	20400.00
17	35614.16	43.75	1.392	0.30 ( 0.29)	0.98	15091.5	20300.00
18	36438.68	46.32	1.351	0.30 ( 0.29)	0.97	16357.6	20210.00
19	36467.48	46.41	1.349	0.30 ( 0.29)	0.97	16401.6	20200.00
20	36489.34	46.48	1.348	0.30 ( 0.29)	0.97	16435.0	30110.00
21	36950.73	48.09	1.322	0.30 ( 0.29)	0.97	17351.9	20100.00
22	37618.46	50.46	1.286	0.30 ( 0.29)	0.97	18694.3	21400.00
23	38026.57	52.72	1.261	0.30 ( 0.29)	0.97	19918.5	13600.00
24	38708.80	56.17	1.224	0.30 ( 0.29)	0.97	21780.2	31400.00
25	40394.63	66.28	1.140	0.30 ( 0.29)	0.97	27025.0	13100.00
26	41101.24	73.36	1.092	0.30 ( 0.29)	0.97	30148.3	11801.00
27	42514.23	84.05	1.019	0.30 ( 0.29)	0.97	35561.4	11530.00
28	43271.53	87.97	0.993	0.30 ( 0.29)	0.97	37978.9	13510.00
29	43341.49	88.35	0.990	0.30 ( 0.29)	0.97	38208.0	11701.00
30	44376.72	93.60	0.963	0.30 ( 0.29)	0.97	41719.5	13010.00
31	44998.43	96.87	0.949	0.30 ( 0.29)	0.97	43931.6	13500.00
32	45940.34	101.79	0.928	0.30 ( 0.29)	0.97	47225.1	10800.00
33	46359.49	106.00	0.910	0.30 ( 0.29)	0.97	50167.9	11130.00
34	45813.15	115.60	0.868	0.30 ( 0.29)	0.98	55206.6	12410.00
35	45078.25	123.92	0.841	0.30 ( 0.29)	0.98	58948.7	11201.00
36	44584.01	128.90	0.831	0.30 ( 0.29)	0.98	60678.4	12201.00
37	43495.41	135.99	0.816	0.30 ( 0.29)	0.98	62533.8	12231.00
38	42125.82	143.86	0.800	0.30 ( 0.29)	0.98	64170.2	10400.00
39	40705.29	151.86	0.783	0.30 ( 0.29)	0.98	65464.7	12010.00
40	39476.49	157.89	0.771	0.30 ( 0.29)	0.98	65813.4	10210.00
41	35085.31	186.30	0.718	0.30 ( 0.29)	0.98	66551.6	10100.00

TOTAL AREA (ACRES) = 66551.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 46359.49 Tc (MIN.) = 105.997  
EFFECTIVE AREA (ACRES) = 50167.86 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA (ACRES) = 66551.6  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13700.00 = 124551.97 FEET.

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 66551.6 TC (MIN.) = 106.00  
EFFECTIVE AREA (ACRES) = 50167.86 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.974  
PEAK FLOW RATE (CFS) = 46359.49

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26658.49	17.95	2.377	0.30 ( 0.29)	0.98	4880.6	21100.00
2	27820.78	20.77	2.156	0.30 ( 0.29)	0.98	5849.6	50800.00
3	27850.15	20.84	2.152	0.30 ( 0.29)	0.98	5874.2	21000.00
4	28220.17	21.76	2.097	0.30 ( 0.29)	0.98	6192.7	50700.00
5	28879.78	23.49	1.995	0.30 ( 0.29)	0.98	6770.8	20810.00
6	29009.01	23.82	1.975	0.30 ( 0.29)	0.98	6884.5	20900.00
7	29161.35	24.22	1.952	0.30 ( 0.29)	0.98	7019.4	50600.00
8	29837.27	26.35	1.854	0.30 ( 0.29)	0.98	7790.5	20800.00

9	30030.29	27.02	1.829	0.30	( 0.29)	0.98	8027.7	50500.00
10	30360.77	28.10	1.787	0.30	( 0.29)	0.98	8413.3	20700.00
11	32310.90	34.45	1.598	0.30	( 0.29)	0.98	10663.2	30600.00
12	32766.98	35.64	1.567	0.30	( 0.29)	0.98	11249.1	20600.00
13	33126.59	36.60	1.542	0.30	( 0.29)	0.98	11713.8	10100.00
14	34710.22	41.03	1.436	0.30	( 0.29)	0.98	13787.5	20500.00
15	35107.32	42.18	1.418	0.30	( 0.29)	0.98	14305.6	30200.00
16	35481.37	43.34	1.399	0.30	( 0.29)	0.98	14888.7	20400.00
17	35614.16	43.75	1.392	0.30	( 0.29)	0.98	15091.5	20300.00
18	36438.68	46.32	1.351	0.30	( 0.29)	0.97	16357.6	20210.00
19	36467.48	46.41	1.349	0.30	( 0.29)	0.97	16401.6	20200.00
20	36489.34	46.48	1.348	0.30	( 0.29)	0.97	16435.0	30110.00
21	36950.73	48.09	1.322	0.30	( 0.29)	0.97	17351.9	20100.00
22	37618.46	50.46	1.286	0.30	( 0.29)	0.97	18694.3	21400.00
23	38026.57	52.72	1.261	0.30	( 0.29)	0.97	19918.5	13600.00
24	38708.80	56.17	1.224	0.30	( 0.29)	0.97	21780.2	31400.00
25	40394.63	66.28	1.140	0.30	( 0.29)	0.97	27025.0	13100.00
26	41101.24	73.36	1.092	0.30	( 0.29)	0.97	30148.3	11801.00
27	42514.23	84.05	1.019	0.30	( 0.29)	0.97	35561.4	11530.00
28	43271.53	87.97	0.993	0.30	( 0.29)	0.97	37978.9	13510.00
29	43341.49	88.35	0.990	0.30	( 0.29)	0.97	38208.0	11701.00
30	44376.72	93.60	0.963	0.30	( 0.29)	0.97	41719.5	13010.00
31	44998.43	96.87	0.949	0.30	( 0.29)	0.97	43931.6	13500.00
32	45940.34	101.79	0.928	0.30	( 0.29)	0.97	47225.1	10800.00
33	46359.49	106.00	0.910	0.30	( 0.29)	0.97	50167.9	11130.00
34	45813.15	115.60	0.868	0.30	( 0.29)	0.98	55206.6	12410.00
35	45078.25	123.92	0.841	0.30	( 0.29)	0.98	58948.7	11201.00
36	44584.01	128.90	0.831	0.30	( 0.29)	0.98	60678.4	12201.00
37	43495.41	135.99	0.816	0.30	( 0.29)	0.98	62533.8	12231.00
38	42125.82	143.86	0.800	0.30	( 0.29)	0.98	64170.2	10400.00
39	40705.29	151.86	0.783	0.30	( 0.29)	0.98	65464.7	12010.00
40	39476.49	157.89	0.771	0.30	( 0.29)	0.98	65813.4	10210.00
41	35085.31	186.30	0.718	0.30	( 0.29)	0.98	66551.6	10100.00

=====  
 END OF RATIONAL METHOD ANALYSIS  
 =====

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

Analysis prepared by:

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FILE NAME: S35.DAT  
TIME/DATE OF STUDY: 11:59 04/03/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 4.440
- 2) 10.00; 3.011
- 3) 15.00; 2.390
- 4) 20.00; 2.029
- 5) 25.00; 1.787
- 6) 30.00; 1.600
- 7) 40.00; 1.368
- 8) 50.00; 1.205
- 9) 60.00; 1.060
- 10) 90.00; 0.862
- 11) 120.00; 0.732
- 12) 180.00; 0.593
- 13) 360.00; 0.412
- 14) 1440.00; 0.172

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13500.00 TO NODE 13500.50 IS CODE = 21  
-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 548.43  
ELEVATION DATA: UPSTREAM(FEET) = 1183.47 DOWNSTREAM(FEET) = 1065.00

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.955  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.768  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)  
NATURAL FAIR COVER  
"OPEN BRUSH" - 5.11 0.30 1.000 0 11.96  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 11.35  
TOTAL AREA (ACRES) = 5.11 PEAK FLOW RATE (CFS) = 11.35

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13500.50 TO NODE 13501.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1065.00 DOWNSTREAM(FEET) = 1033.15  
CHANNEL LENGTH THRU SUBAREA(FEET) = 431.71 CHANNEL SLOPE = 0.0738  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.49  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.538  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN  
USER-DEFINED - 8.87 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.29  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.88  
AVERAGE FLOW DEPTH(FEET) = 0.48 TRAVEL TIME(MIN.) = 1.86  
Tc(MIN.) = 13.81  
SUBAREA AREA(ACRES) = 8.87 SUBAREA RUNOFF(CFS) = 17.86  
EFFECTIVE AREA(ACRES) = 13.98 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 14.0 PEAK FLOW RATE(CFS) = 28.15  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.58

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.58 FLOW VELOCITY(FEET/SEC.) = 4.33  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13501.00 = 980.14 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13501.00 TO NODE 13502.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1033.15 DOWNSTREAM(FEET) = 990.26  
CHANNEL LENGTH THRU SUBAREA(FEET) = 948.63 CHANNEL SLOPE = 0.0452  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.88  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.207  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	16.82	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 42.64  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.25  
AVERAGE FLOW DEPTH(FEET) = 0.86 TRAVEL TIME(MIN.) = 3.72  
Tc(MIN.) = 17.54  
SUBAREA AREA(ACRES) = 16.82 SUBAREA RUNOFF(CFS) = 28.87  
EFFECTIVE AREA(ACRES) = 30.80 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 30.8 PEAK FLOW RATE(CFS) = 52.86  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.97

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.97 FLOW VELOCITY(FEET/SEC.) = 4.55  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13502.00 = 1928.77 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13502.00 TO NODE 13503.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 990.26 DOWNSTREAM(FEET) = 956.06  
CHANNEL LENGTH THRU SUBAREA(FEET) = 940.98 CHANNEL SLOPE = 0.0363  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.42  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.997  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	46.02	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 88.05  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.01  
AVERAGE FLOW DEPTH(FEET) = 1.38 TRAVEL TIME(MIN.) = 3.13  
Tc(MIN.) = 20.67  
SUBAREA AREA(ACRES) = 46.02 SUBAREA RUNOFF(CFS) = 70.28  
EFFECTIVE AREA(ACRES) = 76.82 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 76.8 PEAK FLOW RATE(CFS) = 117.31

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.62

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.62 FLOW VELOCITY(FEET/SEC.) = 5.46  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13503.00 = 2869.75 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13503.00 TO NODE 13504.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 956.06 DOWNSTREAM(FEET) = 889.48  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2131.31 CHANNEL SLOPE = 0.0312  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.02  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.713  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	58.46	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 154.58  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.62  
AVERAGE FLOW DEPTH(FEET) = 1.97 TRAVEL TIME(MIN.) = 6.32  
Tc(MIN.) = 26.98  
SUBAREA AREA(ACRES) = 58.46 SUBAREA RUNOFF(CFS) = 74.34  
EFFECTIVE AREA(ACRES) = 135.28 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 135.3 PEAK FLOW RATE(CFS) = 172.03  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.09

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.09 FLOW VELOCITY(FEET/SEC.) = 5.81  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13504.00 = 5001.06 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13504.00 TO NODE 13505.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 889.48 DOWNSTREAM(FEET) = 848.10  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1661.97 CHANNEL SLOPE = 0.0249  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.43  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.555  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	49.30	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 199.89  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.60  
 AVERAGE FLOW DEPTH(FEET) = 2.41 TRAVEL TIME(MIN.) = 4.94  
 Tc(MIN.) = 31.93  
 SUBAREA AREA(ACRES) = 49.30 SUBAREA RUNOFF(CFS) = 55.70  
 EFFECTIVE AREA(ACRES) = 184.58 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 184.6 PEAK FLOW RATE(CFS) = 208.55  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.46

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.46 FLOW VELOCITY(FEET/SEC.) = 5.68  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13505.00 = 6663.03 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13505.00 TO NODE 13505.50 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 848.10 DOWNSTREAM(FEET) = 811.10  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1234.61 CHANNEL SLOPE = 0.0300  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.47  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.479

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	39.35	0.30	0.811	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.811  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 230.42  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.23  
 AVERAGE FLOW DEPTH(FEET) = 2.47 TRAVEL TIME(MIN.) = 3.30  
 Tc(MIN.) = 35.23  
 SUBAREA AREA(ACRES) = 39.35 SUBAREA RUNOFF(CFS) = 43.75  
 EFFECTIVE AREA(ACRES) = 223.93 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 223.9 PEAK FLOW RATE(CFS) = 239.56  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.52

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.52 FLOW VELOCITY(FEET/SEC.) = 6.31  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13505.50 = 7897.64 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13505.50 TO NODE 13506.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 811.10 DOWNSTREAM(FEET) = 781.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1415.98 CHANNEL SLOPE = 0.0213  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.93  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.384

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	54.33	0.30	0.738	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.738  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 267.98  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.76  
 AVERAGE FLOW DEPTH(FEET) = 2.93 TRAVEL TIME(MIN.) = 4.10  
 Tc(MIN.) = 39.33  
 SUBAREA AREA(ACRES) = 54.33 SUBAREA RUNOFF(CFS) = 56.83  
 EFFECTIVE AREA(ACRES) = 278.26 AREA-AVERAGED Fm(INCH/HR) = 0.28  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.92  
 TOTAL AREA(ACRES) = 278.3 PEAK FLOW RATE(CFS) = 277.24  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.99

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.99 FLOW VELOCITY(FEET/SEC.) = 5.81  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13506.00 = 9313.62 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13506.00 TO NODE 13506.50 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 781.00 DOWNSTREAM(FEET) = 743.17  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1542.62 CHANNEL SLOPE = 0.0245  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.04  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.312

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	61.33	0.30	0.783	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.783  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 306.98  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.30  
 AVERAGE FLOW DEPTH(FEET) = 3.03 TRAVEL TIME(MIN.) = 4.08  
 Tc(MIN.) = 43.41  
 SUBAREA AREA(ACRES) = 61.33 SUBAREA RUNOFF(CFS) = 59.48  
 EFFECTIVE AREA(ACRES) = 339.59 AREA-AVERAGED Fm(INCH/HR) = 0.27  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.90  
 TOTAL AREA(ACRES) = 339.6 PEAK FLOW RATE(CFS) = 318.89  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.09

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.09 FLOW VELOCITY(FEET/SEC.) = 6.36  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13506.50 = 10856.24 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13506.50 TO NODE 13520.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 743.17 DOWNSTREAM(FEET) = 717.04  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1370.93 CHANNEL SLOPE = 0.0191  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.41

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.249

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	39.86	0.30	0.848	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.848

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 336.74

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.90

AVERAGE FLOW DEPTH(FEET) = 3.40 TRAVEL TIME(MIN.) = 3.87

Tc(MIN.) = 47.28

SUBAREA AREA(ACRES) = 39.86 SUBAREA RUNOFF(CFS) = 35.69

EFFECTIVE AREA(ACRES) = 379.45 AREA-AVERAGED Fm(INCH/HR) = 0.27

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.89

TOTAL AREA(ACRES) = 379.5 PEAK FLOW RATE(CFS) = 335.29

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.39

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.39 FLOW VELOCITY(FEET/SEC.) = 5.89

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13520.00 = 12227.17 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13506.00 TO NODE 13520.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

-----  
TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 47.28

RAINFALL INTENSITY(INCH/HR) = 1.25

AREA-AVERAGED Fm(INCH/HR) = 0.27

AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.89

EFFECTIVE STREAM AREA(ACRES) = 379.45

TOTAL STREAM AREA(ACRES) = 379.45

PEAK FLOW RATE(CFS) AT CONFLUENCE = 335.29

\*\*\*\*\*

FLOW PROCESS FROM NODE 13510.00 TO NODE 13511.00 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
INITIAL SUBAREA FLOW-LENGTH(FEET) = 903.68

ELEVATION DATA: UPSTREAM(FEET) = 1216.90 DOWNSTREAM(FEET) = 1022.78

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

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 14.615

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.438

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER						
"GRASS"	-	6.66	0.30	1.000	0	14.62

"GRASS"

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

SUBAREA RUNOFF(CFS) = 12.81

TOTAL AREA(ACRES) = 6.66 PEAK FLOW RATE(CFS) = 12.81

\*\*\*\*\*

FLOW PROCESS FROM NODE 13511.00 TO NODE 13512.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1022.78 DOWNSTREAM(FEET) = 954.27

CHANNEL LENGTH THRU SUBAREA(FEET) = 1027.63 CHANNEL SLOPE = 0.0667

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.71

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.142

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	25.40	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 33.96

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.48

AVERAGE FLOW DEPTH(FEET) = 0.67 TRAVEL TIME(MIN.) = 3.82

Tc(MIN.) = 18.44

SUBAREA AREA(ACRES) = 25.40 SUBAREA RUNOFF(CFS) = 42.11

EFFECTIVE AREA(ACRES) = 32.06 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 32.1 PEAK FLOW RATE(CFS) = 53.15

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.87

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.87 FLOW VELOCITY(FEET/SEC.) = 5.22

LONGEST FLOWPATH FROM NODE 13510.00 TO NODE 13512.00 = 1931.31 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13512.00 TO NODE 13513.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 954.27 DOWNSTREAM(FEET) = 872.45  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1926.42 CHANNEL SLOPE = 0.0425  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.63  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.835  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 90.23 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 115.76  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.76  
 AVERAGE FLOW DEPTH(FEET) = 1.54 TRAVEL TIME(MIN.) = 5.58  
 Tc(MIN.) = 24.02  
 SUBAREA AREA(ACRES) = 90.23 SUBAREA RUNOFF(CFS) = 124.63  
 EFFECTIVE AREA(ACRES) = 122.29 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 122.3 PEAK FLOW RATE(CFS) = 168.91  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.90  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.90 FLOW VELOCITY(FEET/SEC.) = 6.43  
 LONGEST FLOWPATH FROM NODE 13510.00 TO NODE 13513.00 = 3857.73 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13513.00 TO NODE 13514.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 872.45 DOWNSTREAM(FEET) = 813.12  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1895.66 CHANNEL SLOPE = 0.0313  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.62  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.642  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 135.65 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 250.96  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.49  
 AVERAGE FLOW DEPTH(FEET) = 2.56 TRAVEL TIME(MIN.) = 4.87  
 Tc(MIN.) = 28.89  
 SUBAREA AREA(ACRES) = 135.65 SUBAREA RUNOFF(CFS) = 163.81  
 EFFECTIVE AREA(ACRES) = 257.94 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 257.9 PEAK FLOW RATE(CFS) = 311.48  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.87

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.87 FLOW VELOCITY(FEET/SEC.) = 6.91  
 LONGEST FLOWPATH FROM NODE 13510.00 TO NODE 13514.00 = 5753.39 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13514.00 TO NODE 13515.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 813.12 DOWNSTREAM(FEET) = 773.74  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1926.15 CHANNEL SLOPE = 0.0204  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.54  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.506  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 109.30 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 370.83  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.22  
 AVERAGE FLOW DEPTH(FEET) = 3.51 TRAVEL TIME(MIN.) = 5.16  
 Tc(MIN.) = 34.05  
 SUBAREA AREA(ACRES) = 109.30 SUBAREA RUNOFF(CFS) = 118.64  
 EFFECTIVE AREA(ACRES) = 367.24 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 367.2 PEAK FLOW RATE(CFS) = 398.63  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.64

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.64 FLOW VELOCITY(FEET/SEC.) = 6.33  
 LONGEST FLOWPATH FROM NODE 13510.00 TO NODE 13515.00 = 7679.54 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13515.00 TO NODE 13520.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 773.74 DOWNSTREAM(FEET) = 717.04  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2279.49 CHANNEL SLOPE = 0.0249  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.98  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.385  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 231.44 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 511.73  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.29



AVERAGE FLOW DEPTH(FEET) = 3.93 TRAVEL TIME(MIN.) = 5.21  
 Tc(MIN.) = 39.27  
 SUBAREA AREA(ACRES) = 231.44 SUBAREA RUNOFF(CFS) = 226.02  
 EFFECTIVE AREA(ACRES) = 598.68 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 598.7 PEAK FLOW RATE(CFS) = 584.67  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.21

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.21 FLOW VELOCITY(FEET/SEC.) = 7.55  
 LONGEST FLOWPATH FROM NODE 13510.00 TO NODE 13520.00 = 9959.03 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13515.00 TO NODE 13520.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

\*\*\*\*\*  
 TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 39.27  
 RAINFALL INTENSITY(INCH/HR) = 1.39  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 598.68  
 TOTAL STREAM AREA(ACRES) = 598.68  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 584.67

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	335.29	47.28	1.249	0.30( 0.27)	0.89	379.5	13500.00
2	584.67	39.27	1.385	0.30( 0.30)	1.00	598.7	13510.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	901.61	39.27	1.385	0.30( 0.29)	0.96	913.8	13510.00
2	846.82	47.28	1.249	0.30( 0.29)	0.96	978.1	13500.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 901.61 Tc(MIN.) = 39.27  
 EFFECTIVE AREA(ACRES) = 913.79 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA(ACRES) = 978.1  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13520.00 = 12227.17 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13520.00 TO NODE 13520.50 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

\*\*\*\*\*  
 ELEVATION DATA: UPSTREAM(FEET) = 717.04 DOWNSTREAM(FEET) = 700.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2019.22 CHANNEL SLOPE = 0.0084  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.61  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.299  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 193.31 0.30 0.965 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.965  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 989.42  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.74  
 AVERAGE FLOW DEPTH(FEET) = 3.60 TRAVEL TIME(MIN.) = 4.99  
 Tc(MIN.) = 44.25

SUBAREA AREA(ACRES) = 193.31 SUBAREA RUNOFF(CFS) = 175.58  
 EFFECTIVE AREA(ACRES) = 1107.10 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA(ACRES) = 1171.4 PEAK FLOW RATE(CFS) = 1006.14  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.63

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.63 FLOW VELOCITY(FEET/SEC.) = 6.78  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13520.50 = 14246.39 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1006.14	44.25	1.299	0.30( 0.29)	0.96	1107.1	13510.00
2	930.80	52.38	1.171	0.30( 0.29)	0.96	1171.4	13500.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 1006.14 Tc(MIN.) = 44.25  
 AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.96 EFFECTIVE AREA(ACRES) = 1107.10

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13520.50 TO NODE 13521.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

\*\*\*\*\*  
 ELEVATION DATA: UPSTREAM(FEET) = 700.00 DOWNSTREAM(FEET) = 661.95  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1622.36 CHANNEL SLOPE = 0.0235  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.82  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.254

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 129.79 0.30 0.897 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.897  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1063.65

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.82  
 AVERAGE FLOW DEPTH (FEET) = 2.82 TRAVEL TIME (MIN.) = 2.75  
 Tc (MIN.) = 47.01  
 SUBAREA AREA (ACRES) = 129.79 SUBAREA RUNOFF (CFS) = 115.02  
 EFFECTIVE AREA (ACRES) = 1236.89 AREA-AVERAGED Fm (INCH/HR) = 0.29  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA (ACRES) = 1301.2 PEAK FLOW RATE (CFS) = 1076.42  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.84

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.84 FLOW VELOCITY (FEET/SEC.) = 9.86  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13521.00 = 15868.75 FEET.

\*\* PEAK FLOW RATE TABLE \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1076.42	47.01	1.254	0.30 (0.29)	0.96	1236.9	13510.00
2	988.17	55.20	1.130	0.30 (0.29)	0.95	1301.2	13500.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 1076.42 Tc (MIN.) = 47.01  
 AREA-AVERAGED Fm (INCH/HR) = 0.29 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.96 EFFECTIVE AREA (ACRES) = 1236.89

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13521.00 TO NODE 13522.00 IS CODE = 56

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<  
 >>>> TRAVELTIME THRU SUBAREA <<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 661.95 DOWNSTREAM (FEET) = 632.19  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2746.01 CHANNEL SLOPE = 0.0108  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 3.73  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.163  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	278.60	0.30	0.905	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.905  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1188.23  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.78  
 AVERAGE FLOW DEPTH (FEET) = 3.71 TRAVEL TIME (MIN.) = 5.88  
 Tc (MIN.) = 52.89  
 SUBAREA AREA (ACRES) = 278.60 SUBAREA RUNOFF (CFS) = 223.58  
 EFFECTIVE AREA (ACRES) = 1515.49 AREA-AVERAGED Fm (INCH/HR) = 0.28  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.95  
 TOTAL AREA (ACRES) = 1579.8 PEAK FLOW RATE (CFS) = 1199.12  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 3.73

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 3.73 FLOW VELOCITY (FEET/SEC.) = 7.81  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13522.00 = 18614.76 FEET.

\*\* PEAK FLOW RATE TABLE \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1199.12	52.89	1.163	0.30 (0.28)	0.95	1515.5	13510.00
2	1092.65	61.25	1.052	0.30 (0.28)	0.94	1579.8	13500.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 1199.12 Tc (MIN.) = 52.89  
 AREA-AVERAGED Fm (INCH/HR) = 0.28 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA (ACRES) = 1515.49

=====

END OF STUDY SUMMARY:  
 TOTAL AREA (ACRES) = 1579.8 TC (MIN.) = 52.89  
 EFFECTIVE AREA (ACRES) = 1515.49 AREA-AVERAGED Fm (INCH/HR) = 0.28  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.947  
 PEAK FLOW RATE (CFS) = 1199.12

\*\* PEAK FLOW RATE TABLE \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1199.12	52.89	1.163	0.30 (0.28)	0.95	1515.5	13510.00
2	1092.65	61.25	1.052	0.30 (0.28)	0.94	1579.8	13500.00

=====

END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2013 Advanced Engineering Software (aes)  
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

-----  
FILE NAME: S36.DAT  
TIME/DATE OF STUDY: 09:52 09/12/2017  
=====

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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

---\*TIME-OF-CONCENTRATION MODEL\*---

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.255
- 2) 10.00; 3.396
- 3) 15.00; 2.615
- 4) 20.00; 2.190
- 5) 25.00; 1.899
- 6) 30.00; 1.707
- 7) 40.00; 1.447
- 8) 50.00; 1.285
- 9) 60.00; 1.174
- 10) 90.00; 0.972
- 11) 120.00; 0.842
- 12) 180.00; 0.717
- 13) 360.00; 0.527
- 14) 1200.00; 0.230

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	STREETS FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13600.00 TO NODE 13600.50 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 488.61  
ELEVATION DATA: UPSTREAM(FEET) = 872.12 DOWNSTREAM(FEET) = 744.80

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.995  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.241

SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)

NATURAL FAIR COVER  
"OPEN BRUSH" - 3.39 0.30 1.000 0 11.00

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

SUBAREA RUNOFF(CFS) = 8.97

TOTAL AREA(ACRES) = 3.39 PEAK FLOW RATE(CFS) = 8.97

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13600.50 TO NODE 13601.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 744.80 DOWNSTREAM(FEET) = 707.32  
CHANNEL LENGTH THRU SUBAREA(FEET) = 418.30 CHANNEL SLOPE = 0.0896  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.43

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.962

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN

USER-DEFINED - 7.45 0.30 1.000 -

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 17.92

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.91

AVERAGE FLOW DEPTH(FEET) = 0.42 TRAVEL TIME(MIN.) = 1.78

Tc(MIN.) = 12.78

SUBAREA AREA(ACRES) = 7.45 SUBAREA RUNOFF(CFS) = 17.85

EFFECTIVE AREA(ACRES) = 10.84 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 10.8 PEAK FLOW RATE(CFS) = 25.97

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.52

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.52 FLOW VELOCITY(FEET/SEC.) = 4.49

LONGEST FLOWPATH FROM NODE 13600.00 TO NODE 13601.00 = 906.91 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13601.00 TO NODE 13602.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 707.32 DOWNSTREAM(FEET) = 657.12  
CHANNEL LENGTH THRU SUBAREA(FEET) = 777.60 CHANNEL SLOPE = 0.0646  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.97

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.596

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	30.96	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 58.05

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.29

AVERAGE FLOW DEPTH(FEET) = 0.93 TRAVEL TIME(MIN.) = 2.45

Tc(MIN.) = 15.23

SUBAREA AREA(ACRES) = 30.96 SUBAREA RUNOFF(CFS) = 63.97

EFFECTIVE AREA(ACRES) = 41.80 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 41.8 PEAK FLOW RATE(CFS) = 86.36

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.16

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.16 FLOW VELOCITY(FEET/SEC.) = 6.03

LONGEST FLOWPATH FROM NODE 13600.00 TO NODE 13602.00 = 1684.51 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13602.00 TO NODE 13603.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 657.12 DOWNSTREAM(FEET) = 584.58  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1186.54 CHANNEL SLOPE = 0.0611  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.36

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.331

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	23.36	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 107.74

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.35

AVERAGE FLOW DEPTH(FEET) = 1.34 TRAVEL TIME(MIN.) = 3.11

Tc(MIN.) = 18.34

SUBAREA AREA(ACRES) = 23.36 SUBAREA RUNOFF(CFS) = 42.70

EFFECTIVE AREA(ACRES) = 65.16 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 65.2 PEAK FLOW RATE(CFS) = 119.11

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.41

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.41 FLOW VELOCITY(FEET/SEC.) = 6.56

LONGEST FLOWPATH FROM NODE 13600.00 TO NODE 13603.00 = 2871.05 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13603.00 TO NODE 13620.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 584.58 DOWNSTREAM(FEET) = 544.91  
CHANNEL LENGTH THRU SUBAREA(FEET) = 860.98 CHANNEL SLOPE = 0.0461  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.67

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.152

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	21.24	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 136.82

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.22

AVERAGE FLOW DEPTH(FEET) = 1.65 TRAVEL TIME(MIN.) = 2.31

Tc(MIN.) = 20.65

SUBAREA AREA(ACRES) = 21.24 SUBAREA RUNOFF(CFS) = 35.41

EFFECTIVE AREA(ACRES) = 86.40 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 86.4 PEAK FLOW RATE(CFS) = 144.04

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.70

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.70 FLOW VELOCITY(FEET/SEC.) = 6.30

LONGEST FLOWPATH FROM NODE 13600.00 TO NODE 13620.00 = 3732.03 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13603.00 TO NODE 13620.00 IS CODE = 10

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

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13522.00 TO NODE 13522.00 IS CODE = 15.1

-----  
>>>>DEFINE MEMORY BANK # 2 <<<<

=====

PEAK FLOWRATE TABLE FILE NAME: S35.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap (ACRES)	Ae (ACRES)	HEADWATER NODE
1	1199.12	52.89	0.30( 0.28)	0.95	1515.5	13510.00

2 1092.65 61.25 0.30( 0.28) 0.94 1579.8 13500.00  
TOTAL AREA(ACRES) = 1579.8

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13522.00 TO NODE 13522.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1199.12	52.89	0.30( 0.28)	0.95	1515.5	13510.00
2	1092.65	61.25	0.30( 0.28)	0.94	1579.8	13500.00

TOTAL AREA(ACRES) = 1579.8

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13522.00 TO NODE 13523.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 632.19 DOWNSTREAM(FEET) = 561.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1151.68 CHANNEL SLOPE = 0.0618  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.29  
CHANNEL FLOW THRU SUBAREA(CFS) = 1199.12  
FLOW VELOCITY(FEET/SEC.) = 14.18 FLOW DEPTH(FEET) = 2.29  
TRAVEL TIME(MIN.) = 1.35 Tc(MIN.) = 54.24  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13523.00 = 19766.44 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1301.13	54.24	1.238	0.30( 0.28)	0.95	1515.5	13510.00
2	1241.13	62.65	1.156	0.30( 0.28)	0.94	1579.8	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1301.13 Tc(MIN.) = 54.24  
AREA-AVERAGED Fm(INCH/HR) = 0.28 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA(ACRES) = 1515.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13523.00 TO NODE 13523.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 2 <<<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13523.00 TO NODE 13523.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: 0610201X.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	82.13	14.42	0.30( 0.30)	1.00	37.9	20100.00

TOTAL AREA(ACRES) = 37.9

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13523.00 TO NODE 13523.00 IS CODE = 11  
-----

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<<  
=====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1301.13	54.24	1.238	0.30( 0.28)	0.95	1515.5	13510.00
2	1241.13	62.65	1.156	0.30( 0.28)	0.94	1579.8	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13523.00 = 19766.44 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	82.13	14.42	2.705	0.30( 0.30)	1.00	37.9	20100.00

LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 13523.00 = 2767.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	960.21	14.42	2.705	0.30( 0.29)	0.95	440.9	20100.00
2	1333.15	54.24	1.238	0.30( 0.28)	0.95	1553.4	13510.00
3	1270.36	62.65	1.156	0.30( 0.28)	0.95	1617.8	13500.00

TOTAL AREA(ACRES) = 1617.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1333.15 Tc(MIN.) = 54.242  
EFFECTIVE AREA(ACRES) = 1553.43 AREA-AVERAGED Fm(INCH/HR) = 0.28  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.95  
TOTAL AREA(ACRES) = 1617.8  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13523.00 = 19766.44 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13523.00 TO NODE 13524.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 561.00 DOWNSTREAM(FEET) = 556.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 238.34 CHANNEL SLOPE = 0.0210  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.30  
CHANNEL FLOW THRU SUBAREA(CFS) = 1333.15  
FLOW VELOCITY(FEET/SEC.) = 10.13 FLOW DEPTH(FEET) = 3.30  
TRAVEL TIME(MIN.) = 0.39 Tc(MIN.) = 54.63  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13524.00 = 20004.78 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	960.21	14.86	2.638	0.30( 0.29)	0.95	440.9	20100.00
2	1333.15	54.63	1.234	0.30( 0.28)	0.95	1553.4	13510.00
3	1270.36	63.04	1.154	0.30( 0.28)	0.95	1617.8	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1333.15 Tc(MIN.) = 54.63  
 AREA-AVERAGED Fm(INCH/HR) = 0.28 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA(ACRES) = 1553.43

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13524.00 TO NODE 13524.00 IS CODE = 12  
 -----

>>>>CLEAR MEMORY BANK # 2 <<<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13524.00 TO NODE 13524.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 2 <<<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610202X.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	68.24	13.11	0.30( 0.30)	1.00	29.0	20210.00
2	68.04	13.20	0.30( 0.30)	1.00	29.1	20200.00
TOTAL AREA(ACRES) =		29.1				

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13524.00 TO NODE 13524.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	960.21	14.86	2.638	0.30( 0.29)	0.95	440.9	20100.00
2	1333.15	54.63	1.234	0.30( 0.28)	0.95	1553.4	13510.00
3	1270.36	63.04	1.154	0.30( 0.28)	0.95	1617.8	13500.00
LONGEST FLOWPATH FROM NODE		13500.00 TO NODE 13524.00 = 20004.78 FEET.					

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	68.24	13.11	2.910	0.30( 0.30)	1.00	29.0	20210.00
2	68.04	13.20	2.896	0.30( 0.30)	1.00	29.1	20200.00
LONGEST FLOWPATH FROM NODE		20210.00 TO NODE 13524.00 = 2247.00 FEET.					

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1013.84	13.11	2.910	0.30( 0.29)	0.95	418.1	20210.00
2	1015.03	13.20	2.896	0.30( 0.29)	0.95	420.8	20200.00
3	1021.47	14.86	2.638	0.30( 0.29)	0.95	470.0	20100.00
4	1357.62	54.63	1.234	0.30( 0.28)	0.95	1582.5	13510.00
5	1292.73	63.04	1.154	0.30( 0.28)	0.95	1646.9	13500.00
TOTAL AREA(ACRES) =		1646.9					

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1357.62 Tc(MIN.) = 54.635  
 EFFECTIVE AREA(ACRES) = 1582.54 AREA-AVERAGED Fm(INCH/HR) = 0.28

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.95  
 TOTAL AREA(ACRES) = 1646.9  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13524.00 = 20004.78 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13524.00 TO NODE 13620.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 556.00 DOWNSTREAM(FEET) = 544.91  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 672.93 CHANNEL SLOPE = 0.0165  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.58  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.220

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	27.94	0.30	0.884	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.884  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1369.63  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.41  
 AVERAGE FLOW DEPTH(FEET) = 3.58 TRAVEL TIME(MIN.) = 1.19  
 Tc(MIN.) = 55.83

SUBAREA AREA(ACRES) = 27.94 SUBAREA RUNOFF(CFS) = 24.02  
 EFFECTIVE AREA(ACRES) = 1610.48 AREA-AVERAGED Fm(INCH/HR) = 0.28  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.95  
 TOTAL AREA(ACRES) = 1674.8 PEAK FLOW RATE(CFS) = 1357.62  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.56

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.56 FLOW VELOCITY(FEET/SEC.) = 9.38  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13620.00 = 20677.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1013.84	14.41	2.708	0.30( 0.29)	0.95	446.0	20210.00
2	1015.03	14.50	2.694	0.30( 0.29)	0.95	448.8	20200.00
3	1021.47	16.15	2.517	0.30( 0.29)	0.95	497.9	20100.00
4	1357.62	55.83	1.220	0.30( 0.28)	0.95	1610.5	13510.00
5	1298.87	64.25	1.145	0.30( 0.28)	0.95	1674.8	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1357.62 Tc(MIN.) = 55.83  
 AREA-AVERAGED Fm(INCH/HR) = 0.28 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA(ACRES) = 1610.48

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13603.00 TO NODE 13620.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<<

```

** MAIN STREAM CONFLUENCE DATA **
STREAM      Q      Tc      Intensity  Fp(Fm)  Ap      Ae      HEADWATER
NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR) (ACRES)  NODE
1          1013.84  14.41   2.708    0.30( 0.29) 0.95   446.0   20210.00
2          1015.03  14.50   2.694    0.30( 0.29) 0.95   448.8   20200.00
3          1021.47  16.15   2.517    0.30( 0.29) 0.95   497.9   20100.00
4          1357.62  55.83   1.220    0.30( 0.28) 0.95   1610.5  13510.00
5          1298.87  64.25   1.145    0.30( 0.28) 0.95   1674.8  13500.00
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13620.00 = 20677.71 FEET.

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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          144.04  20.65   2.152    0.30( 0.30) 1.00    86.4   13600.00
LONGEST FLOWPATH FROM NODE 13600.00 TO NODE 13620.00 = 3732.03 FEET.

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** PEAK FLOW RATE TABLE **
STREAM      Q      Tc      Intensity  Fp(Fm)  Ap      Ae      HEADWATER
NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR) (ACRES)  NODE
1          1144.48  14.41   2.708    0.30( 0.29) 0.96    506.3  20210.00
2          1145.72  14.50   2.694    0.30( 0.29) 0.96    509.4  20200.00
3          1156.33  16.15   2.517    0.30( 0.29) 0.96    565.5  20100.00
4          1203.61  20.65   2.152    0.30( 0.29) 0.96    710.4  13600.00
5          1429.19  55.83   1.220    0.30( 0.29) 0.95    1696.9 13510.00
6          1364.61  64.25   1.145    0.30( 0.28) 0.95    1761.2 13500.00
TOTAL AREA (ACRES) = 1761.2

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COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 1429.19 Tc(MIN.) = 55.827
EFFECTIVE AREA(ACRES) = 1696.88 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 1761.2
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13620.00 = 20677.71 FEET.

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*****
FLOW PROCESS FROM NODE 13620.00 TO NODE 13621.00 IS CODE = 56

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

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=====
ELEVATION DATA: UPSTREAM(FEET) = 544.91 DOWNSTREAM(FEET) = 527.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 868.57 CHANNEL SLOPE = 0.0206
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.44
CHANNEL FLOW THRU SUBAREA(CFS) = 1429.19
FLOW VELOCITY(FEET/SEC.) = 10.29 FLOW DEPTH(FEET) = 3.44
TRAVEL TIME(MIN.) = 1.41 Tc(MIN.) = 57.23
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13621.00 = 21546.28 FEET.

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** PEAK FLOW RATE TABLE **
STREAM      Q      Tc      Intensity  Fp(Fm)  Ap      Ae      HEADWATER
NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR) (ACRES)  NODE
1          1144.48  15.91   2.538    0.30( 0.29) 0.96    506.3  20210.00
2          1145.72  16.00   2.530    0.30( 0.29) 0.96    509.4  20200.00
3          1156.33  17.65   2.390    0.30( 0.29) 0.96    565.5  20100.00
4          1203.61  22.13   2.066    0.30( 0.29) 0.96    710.4  13600.00
5          1429.19  57.23   1.205    0.30( 0.29) 0.95    1696.9 13510.00

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6          1364.61  65.68   1.136    0.30( 0.28) 0.95    1761.2 13500.00
NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 1429.19 Tc(MIN.) = 57.23
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA(ACRES) = 1696.88

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*****
FLOW PROCESS FROM NODE 13621.00 TO NODE 13621.00 IS CODE = 12

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>>>>CLEAR MEMORY BANK # 1 <<<<

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*****
FLOW PROCESS FROM NODE 13621.00 TO NODE 13621.00 IS CODE = 15.1

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>>>>DEFINE MEMORY BANK # 1 <<<<

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=====
PEAK FLOWRATE TABLE FILE NAME: 0610203X.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:
STREAM      Q      Tc      Fp(Fm)  Ap      Ae      HEADWATER
NUMBER      (CFS)   (MIN.) (INCH/HR) (ACRES)  NODE
1          63.11  13.45   0.30( 0.30) 1.00    27.4   20300.00
TOTAL AREA(ACRES) = 27.4

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*****
FLOW PROCESS FROM NODE 13621.00 TO NODE 13621.00 IS CODE = 11

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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<

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** MAIN STREAM CONFLUENCE DATA **
STREAM      Q      Tc      Intensity  Fp(Fm)  Ap      Ae      HEADWATER
NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR) (ACRES)  NODE
1          1144.48  15.91   2.538    0.30( 0.29) 0.96    506.3  20210.00
2          1145.72  16.00   2.530    0.30( 0.29) 0.96    509.4  20200.00
3          1156.33  17.65   2.390    0.30( 0.29) 0.96    565.5  20100.00
4          1203.61  22.13   2.066    0.30( 0.29) 0.96    710.4  13600.00
5          1429.19  57.23   1.205    0.30( 0.29) 0.95    1696.9 13510.00
6          1364.61  65.68   1.136    0.30( 0.28) 0.95    1761.2 13500.00
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13621.00 = 21546.28 FEET.

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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          63.11  13.45   2.857    0.30( 0.30) 1.00    27.4   20300.00
LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 13621.00 = 2609.00 FEET.

```

```

** PEAK FLOW RATE TABLE **
STREAM      Q      Tc      Intensity  Fp(Fm)  Ap      Ae      HEADWATER
NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR) (ACRES)  NODE
1          1167.92  13.45   2.857    0.30( 0.29) 0.96    455.4  20300.00
2          1199.70  15.91   2.538    0.30( 0.29) 0.96    533.7  20210.00
3          1200.75  16.00   2.530    0.30( 0.29) 0.96    536.8  20200.00
4          1207.91  17.65   2.390    0.30( 0.29) 0.96    592.9  20100.00
5          1247.20  22.13   2.066    0.30( 0.29) 0.96    737.8  13600.00
6          1451.52  57.23   1.205    0.30( 0.29) 0.95    1724.3 13510.00
7          1385.24  65.68   1.136    0.30( 0.28) 0.95    1788.6 13500.00
TOTAL AREA(ACRES) = 1788.6

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COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1451.52 Tc(MIN.) = 57.234  
EFFECTIVE AREA(ACRES) = 1724.30 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
TOTAL AREA(ACRES) = 1788.6  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13621.00 = 21546.28 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13621.00 TO NODE 13622.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 527.00 DOWNSTREAM(FEET) = 512.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 56.08 CHANNEL SLOPE = 0.2675  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.68  
CHANNEL FLOW THRU SUBAREA(CFS) = 1451.52  
FLOW VELOCITY(FEET/SEC.) = 24.64 FLOW DEPTH(FEET) = 1.68  
TRAVEL TIME(MIN.) = 0.04 Tc(MIN.) = 57.27  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13622.00 = 21602.36 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1167.92	13.49	2.851	0.30( 0.29)	0.96	455.4	20300.00
2	1199.70	15.95	2.534	0.30( 0.29)	0.96	533.7	20210.00
3	1200.75	16.04	2.526	0.30( 0.29)	0.96	536.8	20200.00
4	1207.91	17.69	2.386	0.30( 0.29)	0.96	592.9	20100.00
5	1247.20	22.17	2.064	0.30( 0.29)	0.96	737.8	13600.00
6	1451.52	57.27	1.204	0.30( 0.29)	0.95	1724.3	13510.00
7	1385.24	65.72	1.135	0.30( 0.28)	0.95	1788.6	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1451.52 Tc(MIN.) = 57.27  
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA(ACRES) = 1724.30

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13622.00 TO NODE 13622.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13622.00 TO NODE 13622.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610204X.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	75.55	13.11	0.30( 0.30)	1.00	32.2	20400.00

TOTAL AREA(ACRES) = 32.2

\*\*\*\*\*

FLOW PROCESS FROM NODE 13622.00 TO NODE 13622.00 IS CODE = 11  
-----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1167.92	13.49	2.851	0.30( 0.29)	0.96	455.4	20300.00
2	1199.70	15.95	2.534	0.30( 0.29)	0.96	533.7	20210.00
3	1200.75	16.04	2.526	0.30( 0.29)	0.96	536.8	20200.00
4	1207.91	17.69	2.386	0.30( 0.29)	0.96	592.9	20100.00
5	1247.20	22.17	2.064	0.30( 0.29)	0.96	737.8	13600.00
6	1451.52	57.27	1.204	0.30( 0.29)	0.95	1724.3	13510.00
7	1385.24	65.72	1.135	0.30( 0.28)	0.95	1788.6	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13622.00 = 21602.36 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	75.55	13.11	2.910	0.30( 0.30)	1.00	32.2	20400.00

LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 13622.00 = 2281.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1236.83	13.11	2.910	0.30( 0.29)	0.96	474.7	20400.00
2	1241.74	13.49	2.851	0.30( 0.29)	0.96	487.6	20300.00
3	1264.36	15.95	2.534	0.30( 0.29)	0.96	565.9	20210.00
4	1265.19	16.04	2.526	0.30( 0.29)	0.96	569.0	20200.00
5	1268.29	17.69	2.386	0.30( 0.29)	0.96	625.1	20100.00
6	1298.25	22.17	2.064	0.30( 0.29)	0.96	770.0	13600.00
7	1477.69	57.27	1.204	0.30( 0.29)	0.95	1756.5	13510.00
8	1409.42	65.72	1.135	0.30( 0.28)	0.95	1820.8	13500.00

TOTAL AREA(ACRES) = 1820.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1477.69 Tc(MIN.) = 57.272  
EFFECTIVE AREA(ACRES) = 1756.46 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
TOTAL AREA(ACRES) = 1820.8  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13622.00 = 21602.36 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13622.00 TO NODE 13640.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 512.00 DOWNSTREAM(FEET) = 489.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 459.72 CHANNEL SLOPE = 0.0500  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.79  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.198  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE      SCS SOIL GROUP      AREA (ACRES)      Fp (INCH/HR)      Ap (DECIMAL)      SCS CN



USER-DEFINED - 112.88 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1523.33  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 14.24  
 AVERAGE FLOW DEPTH( FEET) = 2.79 TRAVEL TIME(MIN.) = 0.54  
 Tc(MIN.) = 57.81  
 SUBAREA AREA(ACRES) = 112.88 SUBAREA RUNOFF(CFS) = 91.27  
 EFFECTIVE AREA(ACRES) = 1869.34 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA(ACRES) = 1933.7 PEAK FLOW RATE(CFS) = 1534.10  
 GIVEN CHANNEL BASE( FEET) = 30.00 CHANNEL FREEBOARD( FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT( FEET) = 2.80

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH( FEET) = 2.80 FLOW VELOCITY( FEET/SEC.) = 14.29  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13640.00 = 22062.08 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1339.31	13.67	2.823	0.30( 0.29)	0.97	587.6	20400.00
2	1336.51	14.05	2.764	0.30( 0.29)	0.97	600.5	20300.00
3	1341.98	16.51	2.487	0.30( 0.29)	0.97	678.8	20210.00
4	1343.35	16.60	2.479	0.30( 0.29)	0.97	681.9	20200.00
5	1360.83	18.25	2.339	0.30( 0.29)	0.97	737.9	20100.00
6	1384.23	22.72	2.031	0.30( 0.29)	0.96	882.9	13600.00
7	1534.10	57.81	1.198	0.30( 0.29)	0.96	1869.3	13510.00
8	1472.28	66.26	1.132	0.30( 0.29)	0.95	1933.7	13500.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 1534.10 Tc(MIN.) = 57.81  
 AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.96 EFFECTIVE AREA(ACRES) = 1869.34

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13640.00 TO NODE 13640.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610205X.DNA  
 MEMORY BANK # 3 DEFINED AS FOLLOWS:  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20.96	11.32	0.30( 0.30)	1.00	8.1	20500.00

 TOTAL AREA(ACRES) = 8.1

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13640.00 TO NODE 13640.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1339.31	13.67	2.823	0.30( 0.29)	0.97	587.6	20400.00
2	1336.51	14.05	2.764	0.30( 0.29)	0.97	600.5	20300.00

3	1341.98	16.51	2.487	0.30( 0.29)	0.97	678.8	20210.00
4	1343.35	16.60	2.479	0.30( 0.29)	0.97	681.9	20200.00
5	1360.83	18.25	2.339	0.30( 0.29)	0.97	737.9	20100.00
6	1384.23	22.72	2.031	0.30( 0.29)	0.96	882.9	13600.00
7	1534.10	57.81	1.198	0.30( 0.29)	0.96	1869.3	13510.00
8	1472.28	66.26	1.132	0.30( 0.29)	0.95	1933.7	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13640.00 = 22062.08 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20.96	11.32	3.191	0.30( 0.30)	1.00	8.1	20500.00

LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 13640.00 = 1025.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1290.67	11.32	3.191	0.30( 0.29)	0.97	494.6	20500.00
2	1357.61	13.67	2.823	0.30( 0.29)	0.97	595.6	20400.00
3	1354.38	14.05	2.764	0.30( 0.29)	0.97	608.5	20300.00
4	1357.84	16.51	2.487	0.30( 0.29)	0.97	686.8	20210.00
5	1359.16	16.60	2.479	0.30( 0.29)	0.97	689.9	20200.00
6	1375.61	18.25	2.339	0.30( 0.29)	0.97	746.0	20100.00
7	1396.78	22.72	2.031	0.30( 0.29)	0.97	890.9	13600.00
8	1540.61	57.81	1.198	0.30( 0.29)	0.96	1877.4	13510.00
9	1478.31	66.26	1.132	0.30( 0.29)	0.95	1941.7	13500.00

TOTAL AREA(ACRES) = 1941.7

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 1540.61 Tc(MIN.) = 57.810  
 EFFECTIVE AREA(ACRES) = 1877.40 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 1941.7  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13640.00 = 22062.08 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13640.00 TO NODE 13641.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM( FEET) = 489.00 DOWNSTREAM( FEET) = 436.89  
 CHANNEL LENGTH THRU SUBAREA( FEET) = 2992.90 CHANNEL SLOPE = 0.0174  
 GIVEN CHANNEL BASE( FEET) = 30.00 CHANNEL FREEBOARD( FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT( FEET) = 3.86  
 \* 50 YEAR RAINFALL INTENSITY( INCH/HR) = 1.155

SUBAREA LOSS RATE DATA( AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	180.31	0.30	1.000	-

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1610.03  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 10.06  
 AVERAGE FLOW DEPTH( FEET) = 3.85 TRAVEL TIME(MIN.) = 4.96  
 Tc(MIN.) = 62.77  
 SUBAREA AREA(ACRES) = 180.31 SUBAREA RUNOFF(CFS) = 138.82

EFFECTIVE AREA (ACRES) = 2057.71 AREA-AVERAGED Fm (INCH/HR) = 0.29  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA (ACRES) = 2122.0 PEAK FLOW RATE (CFS) = 1606.89  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 3.84

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 3.84 FLOW VELOCITY (FEET/SEC.) = 10.07  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13641.00 = 25054.98 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1337.58	16.41	2.495	0.30 (0.29)	0.98	674.9	20500.00
2	1401.75	18.70	2.300	0.30 (0.29)	0.98	775.9	20400.00
3	1401.67	19.09	2.267	0.30 (0.29)	0.98	788.8	20300.00
4	1409.75	21.57	2.099	0.30 (0.29)	0.97	867.1	20210.00
5	1410.78	21.66	2.093	0.30 (0.29)	0.97	870.2	20200.00
6	1422.49	23.30	1.998	0.30 (0.29)	0.97	926.3	20100.00
7	1447.55	27.77	1.793	0.30 (0.29)	0.97	1071.2	13600.00
8	1606.89	62.77	1.155	0.30 (0.29)	0.96	2057.7	13510.00
9	1548.82	71.28	1.098	0.30 (0.29)	0.96	2122.0	13500.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 1606.89 Tc (MIN.) = 62.77  
 AREA-AVERAGED Fm (INCH/HR) = 0.29 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.96 EFFECTIVE AREA (ACRES) = 2057.71

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13641.00 TO NODE 13642.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 436.89 DOWNSTREAM (FEET) = 394.80  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2814.16 CHANNEL SLOPE = 0.0150  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 4.24  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.123  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	451.39	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1774.14  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.83  
 AVERAGE FLOW DEPTH (FEET) = 4.23 TRAVEL TIME (MIN.) = 4.77  
 Tc (MIN.) = 67.54  
 SUBAREA AREA (ACRES) = 451.39 SUBAREA RUNOFF (CFS) = 334.47  
 EFFECTIVE AREA (ACRES) = 2509.10 AREA-AVERAGED Fm (INCH/HR) = 0.29  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA (ACRES) = 2573.4 PEAK FLOW RATE (CFS) = 1881.84  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 4.37

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 4.37 FLOW VELOCITY (FEET/SEC.) = 10.00  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13642.00 = 27869.14 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1847.33	21.23	2.118	0.30 (0.30)	0.99	1126.3	20500.00
2	1867.61	23.50	1.986	0.30 (0.30)	0.99	1227.3	20400.00
3	1861.79	23.89	1.963	0.30 (0.30)	0.98	1240.2	20300.00
4	1840.63	26.38	1.846	0.30 (0.29)	0.98	1318.5	20210.00
5	1840.98	26.47	1.843	0.30 (0.29)	0.98	1321.6	20200.00
6	1841.37	28.11	1.780	0.30 (0.29)	0.98	1377.7	20100.00
7	1844.31	32.59	1.640	0.30 (0.29)	0.98	1522.6	13600.00
8	1881.84	67.54	1.123	0.30 (0.29)	0.97	2509.1	13510.00
9	1797.74	76.11	1.066	0.30 (0.29)	0.96	2573.4	13500.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 1881.84 Tc (MIN.) = 67.54  
 AREA-AVERAGED Fm (INCH/HR) = 0.29 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA (ACRES) = 2509.10

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13642.00 TO NODE 13643.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 394.80 DOWNSTREAM (FEET) = 342.39  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2913.57 CHANNEL SLOPE = 0.0180  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 4.34  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.093  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	434.58	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2037.00  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.92  
 AVERAGE FLOW DEPTH (FEET) = 4.34 TRAVEL TIME (MIN.) = 4.45  
 Tc (MIN.) = 71.98  
 SUBAREA AREA (ACRES) = 434.58 SUBAREA RUNOFF (CFS) = 310.30  
 EFFECTIVE AREA (ACRES) = 2943.68 AREA-AVERAGED Fm (INCH/HR) = 0.29  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA (ACRES) = 3008.0 PEAK FLOW RATE (CFS) = 2124.54  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 4.44

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 4.44 FLOW VELOCITY (FEET/SEC.) = 11.06  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13643.00 = 30782.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
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1	2218.09	25.60	1.876	0.30	( 0.30)	0.99	1560.8	20500.00
2	2231.82	27.87	1.789	0.30	( 0.30)	0.99	1661.9	20400.00
3	2226.03	28.27	1.773	0.30	( 0.30)	0.99	1674.8	20300.00
4	2194.15	30.78	1.687	0.30	( 0.30)	0.99	1753.1	20210.00
5	2194.44	30.87	1.684	0.30	( 0.30)	0.99	1756.2	20200.00
6	2195.11	32.51	1.642	0.30	( 0.30)	0.99	1812.3	20100.00
7	2166.07	37.01	1.525	0.30	( 0.30)	0.98	1957.2	13600.00
8	2124.54	71.98	1.093	0.30	( 0.29)	0.97	2943.7	13510.00
9	2015.01	80.62	1.035	0.30	( 0.29)	0.97	3008.0	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 2231.82 Tc(MIN.) = 27.87  
 AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 1661.92

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13643.00 TO NODE 13660.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 342.39 DOWNSTREAM(FEET) = 300.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1591.23 CHANNEL SLOPE = 0.0266  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.17  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.711

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	109.24	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2301.16  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.01  
 AVERAGE FLOW DEPTH(FEET) = 4.16 TRAVEL TIME(MIN.) = 2.04  
 Tc(MIN.) = 29.91  
 SUBAREA AREA(ACRES) = 109.24 SUBAREA RUNOFF(CFS) = 138.68  
 EFFECTIVE AREA(ACRES) = 1771.16 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 3117.3 PEAK FLOW RATE(CFS) = 2253.42  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.12

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 4.12 FLOW VELOCITY(FEET/SEC.) = 12.92  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13660.00 = 32373.94 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2255.19	27.64	1.798	0.30( 0.30)	0.99	1670.1	20500.00
2	2253.42	29.91	1.711	0.30( 0.30)	0.99	1771.2	20400.00
3	2251.35	30.31	1.699	0.30( 0.30)	0.99	1784.0	20300.00
4	2241.16	32.83	1.633	0.30( 0.30)	0.99	1862.3	20210.00
5	2241.09	32.92	1.631	0.30( 0.30)	0.99	1865.5	20200.00
6	2234.80	34.56	1.588	0.30( 0.30)	0.99	1921.5	20100.00
7	2186.90	39.07	1.471	0.30( 0.30)	0.98	2066.4	13600.00

8	2164.12	74.06	1.079	0.30	( 0.29)	0.97	3052.9	13510.00
9	2047.41	82.73	1.021	0.30	( 0.29)	0.97	3117.3	13500.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 2255.19 Tc(MIN.) = 27.64  
 AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 1670.07

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13643.00 TO NODE 13660.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13660.00 TO NODE 13660.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610206X.DNA  
 MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	294.91	22.21	0.30( 0.30)	1.00	186.0	20600.00
TOTAL AREA(ACRES) =						186.0

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13660.00 TO NODE 13660.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2255.19	27.64	1.798	0.30( 0.30)	0.99	1670.1	20500.00
2	2253.42	29.91	1.711	0.30( 0.30)	0.99	1771.2	20400.00
3	2251.35	30.31	1.699	0.30( 0.30)	0.99	1784.0	20300.00
4	2241.16	32.83	1.633	0.30( 0.30)	0.99	1862.3	20210.00
5	2241.09	32.92	1.631	0.30( 0.30)	0.99	1865.5	20200.00
6	2234.80	34.56	1.588	0.30( 0.30)	0.99	1921.5	20100.00
7	2186.90	39.07	1.471	0.30( 0.30)	0.98	2066.4	13600.00
8	2164.12	74.06	1.079	0.30( 0.29)	0.97	3052.9	13510.00
9	2047.41	82.73	1.021	0.30( 0.29)	0.97	3117.3	13500.00
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13660.00 =							32373.94 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	294.91	22.21	2.061	0.30( 0.30)	1.00	186.0	20600.00
LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 13660.00 =							6967.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2425.69	22.21	2.061	0.30( 0.30)	0.99	1528.2	20600.00
2	2505.97	27.64	1.798	0.30( 0.30)	0.99	1856.1	20500.00
3	2489.61	29.91	1.711	0.30( 0.30)	0.99	1957.2	20400.00
4	2485.60	30.31	1.699	0.30( 0.30)	0.99	1970.1	20300.00

5	2464.45	32.83	1.633	0.30	( 0.30)	0.99	2048.4	20210.00
6	2464.00	32.92	1.631	0.30	( 0.30)	0.99	2051.5	20200.00
7	2450.54	34.56	1.588	0.30	( 0.30)	0.99	2107.6	20100.00
8	2383.04	39.07	1.471	0.30	( 0.30)	0.99	2252.5	13600.00
9	2294.62	74.06	1.079	0.30	( 0.29)	0.97	3238.9	13510.00
10	2168.15	82.73	1.021	0.30	( 0.29)	0.97	3303.3	13500.00

TOTAL AREA (ACRES) = 3303.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 2505.97 Tc (MIN.) = 27.640  
EFFECTIVE AREA (ACRES) = 1856.10 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 3303.3  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13660.00 = 32373.94 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13660.00 TO NODE 13680.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 300.00 DOWNSTREAM (FEET) = 288.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 933.89 CHANNEL SLOPE = 0.0128  
GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.34  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.740

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	61.43	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2545.77  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.35  
AVERAGE FLOW DEPTH (FEET) = 5.34 TRAVEL TIME (MIN.) = 1.50  
Tc (MIN.) = 29.14  
SUBAREA AREA (ACRES) = 61.43 SUBAREA RUNOFF (CFS) = 79.61  
EFFECTIVE AREA (ACRES) = 1917.53 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 3364.7 PEAK FLOW RATE (CFS) = 2505.97  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.30

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 5.30 FLOW VELOCITY (FEET/SEC.) = 10.31  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13680.00 = 33307.83 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2425.69	23.73	1.973	0.30 ( 0.30)	0.99	1589.6	20600.00
2	2505.97	29.14	1.740	0.30 ( 0.30)	0.99	1917.5	20500.00
3	2494.35	31.42	1.670	0.30 ( 0.30)	0.99	2018.6	20400.00
4	2491.31	31.82	1.660	0.30 ( 0.30)	0.99	2031.5	20300.00
5	2464.45	34.34	1.594	0.30 ( 0.30)	0.99	2109.8	20210.00

6	2464.00	34.43	1.592	0.30	( 0.30)	0.99	2112.9	20200.00
7	2450.54	36.08	1.549	0.30	( 0.30)	0.99	2169.0	20100.00
8	2383.04	40.59	1.437	0.30	( 0.30)	0.99	2313.9	13600.00
9	2306.82	75.61	1.069	0.30	( 0.29)	0.97	3300.4	13510.00
10	2175.95	84.30	1.010	0.30	( 0.29)	0.97	3364.7	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 2505.97 Tc (MIN.) = 29.14  
AREA-AVERAGED Fm (INCH/HR) = 0.30 AREA-AVERAGED Fp (INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA (ACRES) = 1917.53

\*\*\*\*\*

FLOW PROCESS FROM NODE 13660.00 TO NODE 13680.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 3 <<<<<

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FLOW PROCESS FROM NODE 13680.00 TO NODE 13680.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610207X.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	352.76	16.08	0.30 ( 0.28)	0.92	174.5	20700.00
TOTAL AREA (ACRES) = 174.5						

\*\*\*\*\*

FLOW PROCESS FROM NODE 13680.00 TO NODE 13680.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2425.69	23.73	1.973	0.30 ( 0.30)	0.99	1589.6	20600.00
2	2505.97	29.14	1.740	0.30 ( 0.30)	0.99	1917.5	20500.00
3	2494.35	31.42	1.670	0.30 ( 0.30)	0.99	2018.6	20400.00
4	2491.31	31.82	1.660	0.30 ( 0.30)	0.99	2031.5	20300.00
5	2464.45	34.34	1.594	0.30 ( 0.30)	0.99	2109.8	20210.00
6	2464.00	34.43	1.592	0.30 ( 0.30)	0.99	2112.9	20200.00
7	2450.54	36.08	1.549	0.30 ( 0.30)	0.99	2169.0	20100.00
8	2383.04	40.59	1.437	0.30 ( 0.30)	0.99	2313.9	13600.00
9	2306.82	75.61	1.069	0.30 ( 0.29)	0.97	3300.4	13510.00
10	2175.95	84.30	1.010	0.30 ( 0.29)	0.97	3364.7	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13680.00 = 33307.83 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	352.76	16.08	2.523	0.30 ( 0.28)	0.92	174.5	20700.00

LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 13680.00 = 6221.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	352.76	16.08	2.523	0.30 ( 0.28)	0.92	174.5	20700.00

1	2536.58	16.08	2.523	0.30	( 0.29)	0.98	1251.9	20700.00
2	2692.08	23.73	1.973	0.30	( 0.30)	0.99	1764.1	20600.00
3	2735.74	29.14	1.740	0.30	( 0.30)	0.99	2092.0	20500.00
4	2713.18	31.42	1.670	0.30	( 0.30)	0.99	2193.1	20400.00
5	2708.50	31.82	1.660	0.30	( 0.30)	0.99	2206.0	20300.00
6	2671.34	34.34	1.594	0.30	( 0.30)	0.98	2284.3	20210.00
7	2670.53	34.43	1.592	0.30	( 0.30)	0.98	2287.4	20200.00
8	2650.33	36.08	1.549	0.30	( 0.30)	0.98	2343.5	20100.00
9	2565.31	40.59	1.437	0.30	( 0.29)	0.98	2488.4	13600.00
10	2431.20	75.61	1.069	0.30	( 0.29)	0.97	3474.9	13510.00
11	2291.14	84.30	1.010	0.30	( 0.29)	0.97	3539.2	13500.00

TOTAL AREA (ACRES) = 3539.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 2735.74 Tc (MIN.) = 29.144  
EFFECTIVE AREA (ACRES) = 2092.04 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 3539.2  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13680.00 = 33307.83 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13680.00 TO NODE 13682.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 288.00 DOWNSTREAM (FEET) = 242.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2860.77 CHANNEL SLOPE = 0.0161  
GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.31

\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.622

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	112.53	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2802.67

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.53

AVERAGE FLOW DEPTH (FEET) = 5.30 TRAVEL TIME (MIN.) = 4.14

Tc (MIN.) = 33.28

SUBAREA AREA (ACRES) = 112.53 SUBAREA RUNOFF (CFS) = 133.87

EFFECTIVE AREA (ACRES) = 2204.57 AREA-AVERAGED Fm (INCH/HR) = 0.30

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99

TOTAL AREA (ACRES) = 3651.8 PEAK FLOW RATE (CFS) = 2735.74

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.23

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 5.23 FLOW VELOCITY (FEET/SEC.) = 11.45

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.00 = 36168.60 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2536.58	20.30	2.173	0.30 ( 0.30)	0.98	1364.5	20700.00
2	2692.08	27.88	1.788	0.30 ( 0.30)	0.99	1876.7	20600.00
3	2735.74	33.28	1.622	0.30 ( 0.30)	0.99	2204.6	20500.00
4	2713.18	35.56	1.562	0.30 ( 0.30)	0.99	2305.7	20400.00
5	2708.50	35.97	1.552	0.30 ( 0.30)	0.99	2318.5	20300.00
6	2671.34	38.50	1.486	0.30 ( 0.30)	0.99	2396.8	20210.00
7	2670.53	38.59	1.484	0.30 ( 0.30)	0.99	2400.0	20200.00
8	2650.33	40.25	1.443	0.30 ( 0.30)	0.98	2456.0	20100.00
9	2565.31	44.81	1.369	0.30 ( 0.29)	0.98	2600.9	13600.00
10	2431.20	79.90	1.040	0.30 ( 0.29)	0.97	3587.4	13510.00
11	2291.14	88.66	0.981	0.30 ( 0.29)	0.97	3651.8	13500.00

1	2536.58	20.30	2.173	0.30	( 0.30)	0.98	1364.5	20700.00
2	2692.08	27.88	1.788	0.30	( 0.30)	0.99	1876.7	20600.00
3	2735.74	33.28	1.622	0.30	( 0.30)	0.99	2204.6	20500.00
4	2713.18	35.56	1.562	0.30	( 0.30)	0.99	2305.7	20400.00
5	2708.50	35.97	1.552	0.30	( 0.30)	0.99	2318.5	20300.00
6	2671.34	38.50	1.486	0.30	( 0.30)	0.99	2396.8	20210.00
7	2670.53	38.59	1.484	0.30	( 0.30)	0.99	2400.0	20200.00
8	2650.33	40.25	1.443	0.30	( 0.30)	0.98	2456.0	20100.00
9	2565.31	44.81	1.369	0.30	( 0.29)	0.98	2600.9	13600.00
10	2431.20	79.90	1.040	0.30	( 0.29)	0.97	3587.4	13510.00
11	2291.14	88.66	0.981	0.30	( 0.29)	0.97	3651.8	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 2735.74 Tc (MIN.) = 33.28

AREA-AVERAGED Fm (INCH/HR) = 0.30 AREA-AVERAGED Fp (INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA (ACRES) = 2204.57

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13680.00 TO NODE 13682.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13682.00 TO NODE 13682.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610208X.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	343.71	15.59	0.30	( 0.30)	0.99	168.5	20810.00
2	337.32	18.53	0.30	( 0.30)	0.99	185.8	20800.00
TOTAL AREA (ACRES) =							185.8

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13682.00 TO NODE 13682.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2536.58	20.30	2.173	0.30 ( 0.30)	0.98	1364.5	20700.00
2	2692.08	27.88	1.788	0.30 ( 0.30)	0.99	1876.7	20600.00
3	2735.74	33.28	1.622	0.30 ( 0.30)	0.99	2204.6	20500.00
4	2713.18	35.56	1.562	0.30 ( 0.30)	0.99	2305.7	20400.00
5	2708.50	35.97	1.552	0.30 ( 0.30)	0.99	2318.5	20300.00
6	2671.34	38.50	1.486	0.30 ( 0.30)	0.99	2396.8	20210.00
7	2670.53	38.59	1.484	0.30 ( 0.30)	0.99	2400.0	20200.00
8	2650.33	40.25	1.443	0.30 ( 0.30)	0.98	2456.0	20100.00
9	2565.31	44.81	1.369	0.30 ( 0.29)	0.98	2600.9	13600.00
10	2431.20	79.90	1.040	0.30 ( 0.29)	0.97	3587.4	13510.00
11	2291.14	88.66	0.981	0.30 ( 0.29)	0.97	3651.8	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.00 = 36168.60 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	343.71	15.59	2.565	0.30 ( 0.30)	0.99	168.5	20810.00
2	337.32	18.53	2.315	0.30 ( 0.30)	0.99	185.8	20800.00

LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 13682.00 = 5285.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2699.11	15.59	2.565	0.30 ( 0.30)	0.99	1216.7	20810.00
2	2828.47	18.53	2.315	0.30 ( 0.30)	0.99	1431.4	20800.00
3	2850.08	20.30	2.173	0.30 ( 0.30)	0.99	1550.3	20700.00
4	2941.29	27.88	1.788	0.30 ( 0.30)	0.99	2062.5	20600.00
5	2957.07	33.28	1.622	0.30 ( 0.30)	0.99	2390.4	20500.00
6	2924.60	35.56	1.562	0.30 ( 0.30)	0.99	2491.5	20400.00
7	2918.15	35.97	1.552	0.30 ( 0.30)	0.99	2504.4	20300.00
8	2869.96	38.50	1.486	0.30 ( 0.30)	0.99	2582.7	20210.00
9	2868.76	38.59	1.484	0.30 ( 0.30)	0.99	2585.8	20200.00
10	2841.75	40.25	1.443	0.30 ( 0.30)	0.99	2641.8	20100.00
11	2744.39	44.81	1.369	0.30 ( 0.30)	0.98	2786.8	13600.00
12	2555.24	79.90	1.040	0.30 ( 0.29)	0.97	3773.2	13510.00
13	2405.31	88.66	0.981	0.30 ( 0.29)	0.97	3837.6	13500.00

TOTAL AREA (ACRES) = 3837.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 2957.07 Tc (MIN.) = 33.280  
EFFECTIVE AREA (ACRES) = 2390.38 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 3837.6  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.00 = 36168.60 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13682.00 TO NODE 13682.50 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 242.00 DOWNSTREAM (FEET) = 230.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 660.20 CHANNEL SLOPE = 0.0182  
GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.28  
CHANNEL FLOW THRU SUBAREA (CFS) = 2957.07  
FLOW VELOCITY (FEET/SEC.) = 12.23 FLOW DEPTH (FEET) = 5.28  
TRAVEL TIME (MIN.) = 0.90 Tc (MIN.) = 34.18  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.50 = 36828.80 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2699.11	16.51	2.486	0.30 ( 0.30)	0.99	1216.7	20810.00
2	2828.47	19.44	2.238	0.30 ( 0.30)	0.99	1431.4	20800.00
3	2850.08	21.21	2.120	0.30 ( 0.30)	0.99	1550.3	20700.00
4	2941.29	28.78	1.754	0.30 ( 0.30)	0.99	2062.5	20600.00
5	2957.07	34.18	1.598	0.30 ( 0.30)	0.99	2390.4	20500.00
6	2924.60	36.46	1.539	0.30 ( 0.30)	0.99	2491.5	20400.00
7	2918.15	36.87	1.528	0.30 ( 0.30)	0.99	2504.4	20300.00
8	2869.96	39.41	1.462	0.30 ( 0.30)	0.99	2582.7	20210.00

9	2868.76	39.50	1.460	0.30 ( 0.30)	0.99	2585.8	20200.00
10	2841.75	41.16	1.428	0.30 ( 0.30)	0.99	2641.8	20100.00
11	2744.39	45.73	1.354	0.30 ( 0.30)	0.98	2786.8	13600.00
12	2555.24	80.84	1.034	0.30 ( 0.29)	0.97	3773.2	13510.00
13	2405.31	89.62	0.975	0.30 ( 0.29)	0.97	3837.6	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 2957.07 Tc (MIN.) = 34.18  
AREA-AVERAGED Fm (INCH/HR) = 0.30 AREA-AVERAGED Fp (INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA (ACRES) = 2390.38

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13682.50 TO NODE 13682.50 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13682.50 TO NODE 13682.50 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610209X.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	149.04	16.86	0.30 ( 0.30)	1.00	76.8	20900.00

TOTAL AREA (ACRES) = 76.8

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13682.50 TO NODE 13682.50 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2699.11	16.51	2.486	0.30 ( 0.30)	0.99	1216.7	20810.00
2	2828.47	19.44	2.238	0.30 ( 0.30)	0.99	1431.4	20800.00
3	2850.08	21.21	2.120	0.30 ( 0.30)	0.99	1550.3	20700.00
4	2941.29	28.78	1.754	0.30 ( 0.30)	0.99	2062.5	20600.00
5	2957.07	34.18	1.598	0.30 ( 0.30)	0.99	2390.4	20500.00
6	2924.60	36.46	1.539	0.30 ( 0.30)	0.99	2491.5	20400.00
7	2918.15	36.87	1.528	0.30 ( 0.30)	0.99	2504.4	20300.00
8	2869.96	39.41	1.462	0.30 ( 0.30)	0.99	2582.7	20210.00
9	2868.76	39.50	1.460	0.30 ( 0.30)	0.99	2585.8	20200.00
10	2841.75	41.16	1.428	0.30 ( 0.30)	0.99	2641.8	20100.00
11	2744.39	45.73	1.354	0.30 ( 0.30)	0.98	2786.8	13600.00
12	2555.24	80.84	1.034	0.30 ( 0.29)	0.97	3773.2	13510.00
13	2405.31	89.62	0.975	0.30 ( 0.29)	0.97	3837.6	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.50 = 36828.80 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	149.04	16.86	2.457	0.30 ( 0.30)	1.00	76.8	20900.00

LONGEST FLOWPATH FROM NODE 20900.00 TO NODE 13682.50 = 4089.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2847.10	16.51	2.486	0.30( 0.30)	0.99	1291.9	20810.00
2	2863.23	16.86	2.457	0.30( 0.30)	0.99	1318.5	20900.00
3	2962.34	19.44	2.238	0.30( 0.30)	0.99	1508.1	20800.00
4	2975.81	21.21	2.120	0.30( 0.30)	0.99	1627.0	20700.00
5	3041.73	28.78	1.754	0.30( 0.30)	0.99	2139.2	20600.00
6	3046.77	34.18	1.598	0.30( 0.30)	0.99	2467.1	20500.00
7	3010.20	36.46	1.539	0.30( 0.30)	0.99	2568.2	20400.00
8	3003.02	36.87	1.528	0.30( 0.30)	0.99	2581.1	20300.00
9	2950.27	39.41	1.462	0.30( 0.30)	0.99	2659.4	20210.00
10	2948.91	39.50	1.460	0.30( 0.30)	0.99	2662.5	20200.00
11	2919.69	41.16	1.428	0.30( 0.30)	0.99	2718.6	20100.00
12	2817.23	45.73	1.354	0.30( 0.30)	0.98	2863.5	13600.00
13	2605.93	80.84	1.034	0.30( 0.29)	0.97	3850.0	13510.00
14	2451.92	89.62	0.975	0.30( 0.29)	0.97	3914.3	13500.00
TOTAL AREA (ACRES) =							3914.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 3046.77 Tc(MIN.) = 34.180  
 EFFECTIVE AREA(ACRES) = 2467.14 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 3914.3  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.50 = 36828.80 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13682.50 TO NODE 13683.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 230.00 DOWNSTREAM(FEET) = 208.53  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1866.20 CHANNEL SLOPE = 0.0115  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 6.08  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.521  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	62.32	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3081.02  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.51  
 AVERAGE FLOW DEPTH(FEET) = 6.08 TRAVEL TIME(MIN.) = 2.96  
 Tc(MIN.) = 37.14  
 SUBAREA AREA(ACRES) = 62.32 SUBAREA RUNOFF(CFS) = 68.51  
 EFFECTIVE AREA(ACRES) = 2529.46 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 3976.6 PEAK FLOW RATE(CFS) = 3046.77  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 6.05  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 6.05 FLOW VELOCITY(FEET/SEC.) = 10.47  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13683.00 = 38695.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2847.10	19.53	2.230	0.30( 0.30)	0.99	1354.2	20810.00
2	2863.23	19.86	2.202	0.30( 0.30)	0.99	1380.8	20900.00
3	2962.34	22.42	2.049	0.30( 0.30)	0.99	1570.4	20800.00
4	2975.81	24.18	1.947	0.30( 0.30)	0.99	1689.3	20700.00
5	3041.73	31.74	1.662	0.30( 0.30)	0.99	2201.6	20600.00
6	3046.77	37.14	1.521	0.30( 0.30)	0.99	2529.5	20500.00
7	3010.20	39.43	1.462	0.30( 0.30)	0.99	2630.5	20400.00
8	3003.02	39.84	1.451	0.30( 0.30)	0.99	2643.4	20300.00
9	2950.27	42.40	1.408	0.30( 0.30)	0.99	2721.7	20210.00
10	2948.91	42.49	1.407	0.30( 0.30)	0.99	2724.8	20200.00
11	2919.69	44.16	1.380	0.30( 0.30)	0.99	2780.9	20100.00
12	2817.23	48.75	1.305	0.30( 0.30)	0.98	2925.8	13600.00
13	2605.93	83.93	1.013	0.30( 0.29)	0.97	3912.3	13510.00
14	2451.92	92.77	0.960	0.30( 0.29)	0.97	3976.6	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 3046.77 Tc(MIN.) = 37.14  
 AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 2529.46

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13683.00 TO NODE 13684.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 208.53 DOWNSTREAM(FEET) = 200.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 166.32 CHANNEL SLOPE = 0.0513  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.06  
 CHANNEL FLOW THRU SUBAREA(CFS) = 3046.77  
 FLOW VELOCITY(FEET/SEC.) = 17.78 FLOW DEPTH(FEET) = 4.06  
 TRAVEL TIME(MIN.) = 0.16 Tc(MIN.) = 37.30  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13684.00 = 38861.32 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2847.10	19.69	2.217	0.30( 0.30)	0.99	1354.2	20810.00
2	2863.23	20.02	2.189	0.30( 0.30)	0.99	1380.8	20900.00
3	2962.34	22.58	2.040	0.30( 0.30)	0.99	1570.4	20800.00
4	2975.81	24.34	1.938	0.30( 0.30)	0.99	1689.3	20700.00
5	3041.73	31.90	1.658	0.30( 0.30)	0.99	2201.6	20600.00
6	3046.77	37.30	1.517	0.30( 0.30)	0.99	2529.5	20500.00
7	3010.20	39.59	1.458	0.30( 0.30)	0.99	2630.5	20400.00
8	3003.02	40.00	1.447	0.30( 0.30)	0.99	2643.4	20300.00
9	2950.27	42.56	1.406	0.30( 0.30)	0.99	2721.7	20210.00
10	2948.91	42.64	1.404	0.30( 0.30)	0.99	2724.8	20200.00
11	2919.69	44.32	1.377	0.30( 0.30)	0.99	2780.9	20100.00
12	2817.23	48.91	1.303	0.30( 0.30)	0.98	2925.8	13600.00
13	2605.93	84.10	1.012	0.30( 0.29)	0.97	3912.3	13510.00
14	2451.92	92.94	0.959	0.30( 0.29)	0.97	3976.6	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 3046.77 Tc(MIN.) = 37.30
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 2529.46

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FLOW PROCESS FROM NODE 13684.00 TO NODE 13684.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 3 <<<<<

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FLOW PROCESS FROM NODE 13684.00 TO NODE 13684.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610210X.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

Table with 7 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Row 1: 1, 159.68, 17.00, 0.30 (0.30), 1.00, 82.7, 21000.00. TOTAL AREA(ACRES) = 82.7

\*\*\*\*\*

FLOW PROCESS FROM NODE 13684.00 TO NODE 13684.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

Table with 7 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 1-14 showing flow data for various stream numbers.

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13684.00 = 38861.32 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

Table with 7 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Row 1: 1, 159.68, 17.00, 2.445, 0.30 (0.30), 1.00, 82.7, 21000.00

LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 13684.00 = 4160.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 7 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Row 1: 1, 2910.65, 17.00, 2.445, 0.30 (0.30), 0.99, 1252.2, 21000.00

Table with 7 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 2-15 showing flow data for various stream numbers. TOTAL AREA(ACRES) = 4059.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 3142.81 Tc(MIN.) = 31.896
EFFECTIVE AREA(ACRES) = 2284.27 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 4059.3
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13684.00 = 38861.32 FEET.

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FLOW PROCESS FROM NODE 13684.00 TO NODE 13685.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 200.00 DOWNSTREAM(FEET) = 194.24
CHANNEL LENGTH THRU SUBAREA(FEET) = 122.69 CHANNEL SLOPE = 0.0469
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.23
CHANNEL FLOW THRU SUBAREA(CFS) = 3142.81
FLOW VELOCITY(FEET/SEC.) = 17.41 FLOW DEPTH(FEET) = 4.23
TRAVEL TIME(MIN.) = 0.12 Tc(MIN.) = 32.01
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13685.00 = 38984.01 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 7 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 1-15 showing flow data for various stream numbers.

NEW PEAK FLOW DATA ARE:



PEAK FLOW RATE(CFS) = 3142.81 Tc(MIN.) = 32.01  
 AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 2284.27

\*\*\*\*\*

FLOW PROCESS FROM NODE 13685.00 TO NODE 13410.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 194.24 DOWNSTREAM(FEET) = 178.72  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1843.57 CHANNEL SLOPE = 0.0084  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.66

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.570

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	8.39	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3147.61

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.45

AVERAGE FLOW DEPTH(FEET) = 6.66 TRAVEL TIME(MIN.) = 3.25

Tc(MIN.) = 35.26

SUBAREA AREA(ACRES) = 8.39 SUBAREA RUNOFF(CFS) = 9.59

EFFECTIVE AREA(ACRES) = 2292.66 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99

TOTAL AREA(ACRES) = 4067.7 PEAK FLOW RATE(CFS) = 3142.81

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.66

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 6.66 FLOW VELOCITY(FEET/SEC.) = 9.45

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13410.00 = 40827.58 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2910.65	20.44	2.164	0.30( 0.30)	0.99	1260.6	21000.00
2	2989.79	23.10	2.010	0.30( 0.30)	0.99	1445.3	20810.00
3	3003.85	23.43	1.990	0.30( 0.30)	0.99	1471.9	20900.00
4	3091.89	25.96	1.862	0.30( 0.30)	0.99	1661.5	20800.00
5	3097.72	27.72	1.795	0.30( 0.30)	0.99	1780.4	20700.00
6	3142.81	35.26	1.570	0.30( 0.30)	0.99	2292.7	20600.00
7	3137.40	40.67	1.436	0.30( 0.30)	0.99	2620.6	20500.00
8	3096.39	42.97	1.399	0.30( 0.30)	0.99	2721.6	20400.00
9	3088.42	43.38	1.392	0.30( 0.30)	0.99	2734.5	20300.00
10	3032.58	45.96	1.350	0.30( 0.30)	0.99	2812.8	20210.00
11	3031.11	46.05	1.349	0.30( 0.30)	0.99	2815.9	20200.00
12	2999.88	47.73	1.322	0.30( 0.30)	0.99	2872.0	20100.00
13	2891.88	52.36	1.259	0.30( 0.30)	0.98	3016.9	13600.00
14	2658.92	87.63	0.988	0.30( 0.29)	0.98	4003.4	13510.00
15	2501.00	96.53	0.944	0.30( 0.29)	0.97	4067.7	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 3142.81 Tc(MIN.) = 35.26  
 AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 2292.66

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 4067.7 TC(MIN.) = 35.26

EFFECTIVE AREA(ACRES) = 2292.66 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.988

PEAK FLOW RATE(CFS) = 3142.81

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2910.65	20.44	2.164	0.30( 0.30)	0.99	1260.6	21000.00
2	2989.79	23.10	2.010	0.30( 0.30)	0.99	1445.3	20810.00
3	3003.85	23.43	1.990	0.30( 0.30)	0.99	1471.9	20900.00
4	3091.89	25.96	1.862	0.30( 0.30)	0.99	1661.5	20800.00
5	3097.72	27.72	1.795	0.30( 0.30)	0.99	1780.4	20700.00
6	3142.81	35.26	1.570	0.30( 0.30)	0.99	2292.7	20600.00
7	3137.40	40.67	1.436	0.30( 0.30)	0.99	2620.6	20500.00
8	3096.39	42.97	1.399	0.30( 0.30)	0.99	2721.6	20400.00
9	3088.42	43.38	1.392	0.30( 0.30)	0.99	2734.5	20300.00
10	3032.58	45.96	1.350	0.30( 0.30)	0.99	2812.8	20210.00
11	3031.11	46.05	1.349	0.30( 0.30)	0.99	2815.9	20200.00
12	2999.88	47.73	1.322	0.30( 0.30)	0.99	2872.0	20100.00
13	2891.88	52.36	1.259	0.30( 0.30)	0.98	3016.9	13600.00
14	2658.92	87.63	0.988	0.30( 0.29)	0.98	4003.4	13510.00
15	2501.00	96.53	0.944	0.30( 0.29)	0.97	4067.7	13500.00

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END OF RATIONAL METHOD ANALYSIS

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2013 Advanced Engineering Software (aes)  
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

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FILE NAME: S37.DAT  
TIME/DATE OF STUDY: 10:47 09/12/2017  
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--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.240
- 2) 10.00; 3.389
- 3) 15.00; 2.611
- 4) 20.00; 2.187
- 5) 25.00; 1.897
- 6) 30.00; 1.705
- 7) 40.00; 1.446
- 8) 50.00; 1.284
- 9) 60.00; 1.172
- 10) 90.00; 0.970
- 11) 120.00; 0.840
- 12) 180.00; 0.715
- 13) 360.00; 0.524
- 14) 1200.00; 0.229

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN CROSSFALL (FT)	STREET / SIDE / WAY	CROSSFALL (FT)	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

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FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<<  
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PEAK FLOWRATE TABLE FILE NAME: S34.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26658.49	17.95	0.30 ( 0.29)	0.98	4880.6	21100.00
2	30360.77	28.10	0.30 ( 0.29)	0.98	8413.3	20700.00
3	33126.59	36.60	0.30 ( 0.29)	0.98	11713.8	10100.00
4	35614.16	43.75	0.30 ( 0.29)	0.98	15091.5	20300.00
5	38708.80	56.17	0.30 ( 0.29)	0.97	21780.2	31400.00
6	40394.63	66.28	0.30 ( 0.29)	0.97	27025.0	13100.00
7	41101.24	73.36	0.30 ( 0.29)	0.97	30148.3	11801.00
8	42514.23	84.05	0.30 ( 0.29)	0.97	35561.4	11530.00
9	43341.49	88.35	0.30 ( 0.29)	0.97	38208.0	11701.00
10	44998.43	96.87	0.30 ( 0.29)	0.97	43931.6	13500.00
11	45940.34	101.79	0.30 ( 0.29)	0.97	47225.1	10800.00
12	46359.49	106.00	0.30 ( 0.29)	0.97	50167.9	11130.00
13	45813.15	115.60	0.30 ( 0.29)	0.98	55206.6	12410.00
14	45078.25	123.92	0.30 ( 0.29)	0.98	58948.7	11201.00
15	44584.01	128.90	0.30 ( 0.29)	0.98	60678.4	12201.00
16	43495.41	135.99	0.30 ( 0.29)	0.98	62533.8	12231.00
17	42125.82	143.86	0.30 ( 0.29)	0.98	64170.2	10400.00
18	40705.29	151.86	0.30 ( 0.29)	0.98	65464.7	12010.00
19	39476.49	157.89	0.30 ( 0.29)	0.98	65813.4	10210.00
20	35085.31	186.30	0.30 ( 0.29)	0.98	66551.6	10100.00
TOTAL AREA (ACRES) =		66551.6				

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FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 14.0  
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>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26658.49	17.95	0.30 ( 0.29)	0.98	4880.6	21100.00
2	30360.77	28.10	0.30 ( 0.29)	0.98	8413.3	20700.00
3	33126.59	36.60	0.30 ( 0.29)	0.98	11713.8	10100.00
4	35614.16	43.75	0.30 ( 0.29)	0.98	15091.5	20300.00
5	38708.80	56.17	0.30 ( 0.29)	0.97	21780.2	31400.00
6	40394.63	66.28	0.30 ( 0.29)	0.97	27025.0	13100.00
7	41101.24	73.36	0.30 ( 0.29)	0.97	30148.3	11801.00
8	42514.23	84.05	0.30 ( 0.29)	0.97	35561.4	11530.00
9	43341.49	88.35	0.30 ( 0.29)	0.97	38208.0	11701.00
10	44998.43	96.87	0.30 ( 0.29)	0.97	43931.6	13500.00
11	45940.34	101.79	0.30 ( 0.29)	0.97	47225.1	10800.00
12	46359.49	106.00	0.30 ( 0.29)	0.97	50167.9	11130.00
13	45813.15	115.60	0.30 ( 0.29)	0.98	55206.6	12410.00
14	45078.25	123.92	0.30 ( 0.29)	0.98	58948.7	11201.00
15	44584.01	128.90	0.30 ( 0.29)	0.98	60678.4	12201.00
16	43495.41	135.99	0.30 ( 0.29)	0.98	62533.8	12231.00
17	42125.82	143.86	0.30 ( 0.29)	0.98	64170.2	10400.00
18	40705.29	151.86	0.30 ( 0.29)	0.98	65464.7	12010.00

19 39476.49 157.89 0.30( 0.29) 0.98 65813.4 10210.00  
20 35085.31 186.30 0.30( 0.29) 0.98 66551.6 10100.00  
TOTAL AREA(ACRES) = 66551.6

\*\*\*\*\*

FLOW PROCESS FROM NODE 13700.00 TO NODE 13701.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 170.00 DOWNSTREAM(FEET) = 167.50  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1699.11 CHANNEL SLOPE = 0.0015  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 16.17  
CHANNEL FLOW THRU SUBAREA(CFS) = 46359.49  
FLOW VELOCITY(FEET/SEC.) = 10.21 FLOW DEPTH(FEET) = 16.17  
TRAVEL TIME(MIN.) = 2.77 Tc(MIN.) = 108.77  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13701.00 = 126251.08 FEET.

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FLOW PROCESS FROM NODE 13701.00 TO NODE 13701.00 IS CODE = 12

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>>>>CLEAR MEMORY BANK # 3 <<<<<

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FLOW PROCESS FROM NODE 13701.00 TO NODE 13701.00 IS CODE = 15.1

-----  
>>>>DEFINE MEMORY BANK # 3 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: 0509102X.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	262.56	23.20	0.30( 0.26)	0.87	167.7	10200.00

TOTAL AREA(ACRES) = 167.7

\*\*\*\*\*

FLOW PROCESS FROM NODE 13701.00 TO NODE 13701.00 IS CODE = 11

-----  
>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

=====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26658.49	21.25	2.115	0.30( 0.29)	0.98	4880.6	21100.00
2	30360.77	31.26	1.672	0.30( 0.29)	0.98	8413.3	20700.00
3	33126.59	39.68	1.454	0.30( 0.29)	0.98	11713.8	10100.00
4	35614.16	46.75	1.337	0.30( 0.29)	0.98	15091.5	20300.00
5	38708.80	59.11	1.182	0.30( 0.29)	0.97	21780.2	31400.00
6	40394.63	69.17	1.110	0.30( 0.29)	0.97	27025.0	13100.00
7	41101.24	76.24	1.063	0.30( 0.29)	0.97	30148.3	11801.00
8	42514.23	86.89	0.991	0.30( 0.29)	0.97	35561.4	11530.00
9	43341.49	91.18	0.965	0.30( 0.29)	0.97	38208.0	11701.00
10	44998.43	99.67	0.928	0.30( 0.29)	0.97	43931.6	13500.00
11	45940.34	104.58	0.907	0.30( 0.29)	0.97	47225.1	10800.00

12	46359.49	108.77	0.889	0.30( 0.29)	0.97	50167.9	11130.00
13	45813.15	118.39	0.847	0.30( 0.29)	0.98	55206.6	12410.00
14	45078.25	126.71	0.826	0.30( 0.29)	0.98	58948.7	11201.00
15	44584.01	131.71	0.816	0.30( 0.29)	0.98	60678.4	12201.00
16	43495.41	138.82	0.801	0.30( 0.29)	0.98	62533.8	12231.00
17	42125.82	146.72	0.784	0.30( 0.29)	0.98	64170.2	10400.00
18	40705.29	154.75	0.768	0.30( 0.29)	0.98	65464.7	12010.00
19	39476.49	160.81	0.755	0.30( 0.29)	0.98	65813.4	10210.00
20	35085.31	189.32	0.705	0.30( 0.29)	0.98	66551.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13701.00 = 126251.08 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	262.56	23.20	2.001	0.30( 0.26)	0.87	167.7	10200.00

LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 13701.00 = 9099.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26914.59	21.25	2.115	0.30( 0.29)	0.98	5034.1	21100.00
2	27644.46	23.20	2.001	0.30( 0.29)	0.98	5738.5	10200.00
3	30573.68	31.26	1.672	0.30( 0.29)	0.98	8580.9	20700.00
4	33306.62	39.68	1.454	0.30( 0.29)	0.98	11881.5	10100.00
5	35776.41	46.75	1.337	0.30( 0.29)	0.97	15259.1	20300.00
6	38847.73	59.11	1.182	0.30( 0.29)	0.97	21947.9	31400.00
7	40522.71	69.17	1.110	0.30( 0.29)	0.97	27192.7	13100.00
8	41222.15	76.24	1.063	0.30( 0.29)	0.97	30316.0	11801.00
9	42624.31	86.89	0.991	0.30( 0.29)	0.97	35729.1	11530.00
10	43447.64	91.18	0.965	0.30( 0.29)	0.97	38375.6	11701.00
11	45099.04	99.67	0.928	0.30( 0.29)	0.97	44099.3	13500.00
12	46037.73	104.58	0.907	0.30( 0.29)	0.97	47392.8	10800.00
13	46454.14	108.77	0.889	0.30( 0.29)	0.97	50335.5	11130.00
14	45901.51	118.39	0.847	0.30( 0.29)	0.98	55374.3	12410.00
15	45163.45	126.71	0.826	0.30( 0.29)	0.98	59116.4	11201.00
16	44667.63	131.71	0.816	0.30( 0.29)	0.98	60846.1	12201.00
17	43576.80	138.82	0.801	0.30( 0.29)	0.98	62701.5	12231.00
18	42204.72	146.72	0.784	0.30( 0.29)	0.98	64337.9	10400.00
19	40781.66	154.75	0.768	0.30( 0.29)	0.98	65632.4	12010.00
20	39550.96	160.81	0.755	0.30( 0.29)	0.98	65981.1	10210.00
21	35152.25	189.32	0.705	0.30( 0.29)	0.98	66719.3	10100.00

TOTAL AREA(ACRES) = 66719.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 46454.14 Tc(MIN.) = 108.772  
EFFECTIVE AREA(ACRES) = 50335.52 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA(ACRES) = 66719.3  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13701.00 = 126251.08 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13701.00 TO NODE 13720.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 167.50 DOWNSTREAM(FEET) = 165.51  
CHANNEL LENGTH THRU SUBAREA(FEET) = 192.72 CHANNEL SLOPE = 0.0103

GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 9.43  
 CHANNEL FLOW THRU SUBAREA (CFS) = 46454.14  
 FLOW VELOCITY (FEET/SEC.) = 19.92 FLOW DEPTH (FEET) = 9.43  
 TRAVEL TIME (MIN.) = 0.16 Tc (MIN.) = 108.93  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13720.00 = 126443.80 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13720.00 TO NODE 13740.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 165.51 DOWNSTREAM (FEET) = 161.63  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2042.40 CHANNEL SLOPE = 0.0019  
 GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 15.10  
 CHANNEL FLOW THRU SUBAREA (CFS) = 46454.14  
 FLOW VELOCITY (FEET/SEC.) = 11.16 FLOW DEPTH (FEET) = 15.10  
 TRAVEL TIME (MIN.) = 3.05 Tc (MIN.) = 111.98  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13740.00 = 128486.20 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13720.00 TO NODE 13740.00 IS CODE = 12  
 -----

>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13740.00 TO NODE 13740.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 3 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: 0509103X.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	763.76	21.98	0.30 ( 0.28)	0.95	474.8	10300.00
TOTAL AREA (ACRES) =						474.8

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13740.00 TO NODE 13740.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

=====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26914.59	25.05	1.895	0.30 ( 0.29)	0.98	5034.1	21100.00
2	27644.46	26.98	1.821	0.30 ( 0.29)	0.98	5738.5	10200.00
3	30573.68	34.92	1.578	0.30 ( 0.29)	0.98	8580.9	20700.00
4	33306.62	43.24	1.394	0.30 ( 0.29)	0.98	11881.5	10100.00
5	35776.41	50.24	1.281	0.30 ( 0.29)	0.97	15259.1	20300.00
6	38847.73	62.50	1.155	0.30 ( 0.29)	0.97	21947.9	31400.00
7	40522.71	72.52	1.088	0.30 ( 0.29)	0.97	27192.7	13100.00

8	41222.15	79.57	1.040	0.30 ( 0.29)	0.97	30316.0	11801.00
9	42624.31	90.19	0.969	0.30 ( 0.29)	0.97	35729.1	11530.00
10	43447.64	94.46	0.951	0.30 ( 0.29)	0.97	38375.6	11701.00
11	45099.04	102.91	0.914	0.30 ( 0.29)	0.97	44099.3	13500.00
12	46037.73	107.80	0.893	0.30 ( 0.29)	0.97	47392.8	10800.00
13	46454.14	111.98	0.875	0.30 ( 0.29)	0.97	50335.5	11130.00
14	45901.51	121.61	0.837	0.30 ( 0.29)	0.98	55374.3	12410.00
15	45163.45	129.95	0.819	0.30 ( 0.29)	0.98	59116.4	11201.00
16	44667.63	134.96	0.809	0.30 ( 0.29)	0.98	60846.1	12201.00
17	43576.80	142.09	0.794	0.30 ( 0.29)	0.98	62701.5	12231.00
18	42204.72	150.03	0.777	0.30 ( 0.29)	0.98	64337.9	10400.00
19	40781.66	158.09	0.761	0.30 ( 0.29)	0.98	65632.4	12010.00
20	39550.96	164.18	0.748	0.30 ( 0.29)	0.98	65981.1	10210.00
21	35152.25	192.82	0.701	0.30 ( 0.29)	0.98	66719.3	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13740.00 = 128486.20 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	763.76	21.98	2.072	0.30 ( 0.28)	0.95	474.8	10300.00
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 13740.00 =							8072.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26990.35	21.98	2.072	0.30 ( 0.29)	0.97	4892.2	10300.00
2	27602.74	25.05	1.895	0.30 ( 0.29)	0.97	5508.9	21100.00
3	28301.01	26.98	1.821	0.30 ( 0.29)	0.97	6213.3	10200.00
4	31126.18	34.92	1.578	0.30 ( 0.29)	0.98	9055.7	20700.00
5	33780.51	43.24	1.394	0.30 ( 0.29)	0.98	12356.3	10100.00
6	36202.34	50.24	1.281	0.30 ( 0.29)	0.97	15733.9	20300.00
7	39219.73	62.50	1.155	0.30 ( 0.29)	0.97	22422.6	31400.00
8	40865.88	72.52	1.088	0.30 ( 0.29)	0.97	27667.4	13100.00
9	41545.04	79.57	1.040	0.30 ( 0.29)	0.97	30790.7	11801.00
10	42916.82	90.19	0.969	0.30 ( 0.29)	0.97	36203.9	11530.00
11	43732.25	94.46	0.951	0.30 ( 0.29)	0.97	38850.4	11701.00
12	45368.00	102.91	0.914	0.30 ( 0.29)	0.97	44574.1	13500.00
13	46297.64	107.80	0.893	0.30 ( 0.29)	0.97	47867.6	10800.00
14	46706.30	111.98	0.875	0.30 ( 0.29)	0.97	50810.3	11130.00
15	46137.39	121.61	0.837	0.30 ( 0.29)	0.98	55849.0	12410.00
16	45391.89	129.95	0.819	0.30 ( 0.29)	0.98	59591.1	11201.00
17	44891.63	134.96	0.809	0.30 ( 0.29)	0.98	61320.9	12201.00
18	43794.44	142.09	0.794	0.30 ( 0.29)	0.98	63176.2	12231.00
19	42415.30	150.03	0.777	0.30 ( 0.29)	0.98	64812.6	10400.00
20	40985.06	158.09	0.761	0.30 ( 0.29)	0.98	66107.2	12010.00
21	39748.94	164.18	0.748	0.30 ( 0.29)	0.98	66455.9	10210.00
22	35330.33	192.82	0.701	0.30 ( 0.29)	0.98	67194.1	10100.00
TOTAL AREA (ACRES) =						67194.1	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 46706.30 Tc (MIN.) = 111.982  
 EFFECTIVE AREA (ACRES) = 50810.28 AREA-AVERAGED Fm (INCH/HR) = 0.29  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA (ACRES) = 67194.1  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13740.00 = 128486.20 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13740.00 TO NODE 13741.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 161.63 DOWNSTREAM(FEET) = 141.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 389.20 CHANNEL SLOPE = 0.0530
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 8.56
CHANNEL FLOW THRU SUBAREA(CFS) = 46706.30
FLOW VELOCITY(FEET/SEC.) = 40.67 FLOW DEPTH(FEET) = 8.56
TRAVEL TIME(MIN.) = 0.16 Tc(MIN.) = 112.14
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13741.00 = 128875.40 FEET.

*****
FLOW PROCESS FROM NODE 13741.00 TO NODE 13802.00 IS CODE = 56
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 141.00 DOWNSTREAM(FEET) = 135.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1533.41 CHANNEL SLOPE = 0.0039
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 17.12
CHANNEL FLOW THRU SUBAREA(CFS) = 46706.30
FLOW VELOCITY(FEET/SEC.) = 16.20 FLOW DEPTH(FEET) = 17.12
TRAVEL TIME(MIN.) = 1.58 Tc(MIN.) = 113.72
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13802.00 = 130408.80 FEET.

*****
FLOW PROCESS FROM NODE 13802.00 TO NODE 13802.00 IS CODE = 12
-----
>>>>CLEAR MEMORY BANK # 3 <<<<
=====
*****
FLOW PROCESS FROM NODE 13802.00 TO NODE 13802.00 IS CODE = 15.1
-----
>>>>DEFINE MEMORY BANK # 3 <<<<
=====
PEAK FLOWRATE TABLE FILE NAME: 0509104X.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 761.98 30.47 1.693 0.30(0.28) 0.94 599.8 10400.00
TOTAL AREA(ACRES) = 599.8

*****
FLOW PROCESS FROM NODE 13802.00 TO NODE 13802.00 IS CODE = 11
-----
>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<
=====
** MAIN STREAM CONFLUENCE DATA **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 26990.35 24.02 1.954 0.30(0.29) 0.97 4892.2 10300.00

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2 27602.74 27.08 1.817 0.30(0.29) 0.97 5508.9 21100.00
3 28301.01 28.98 1.744 0.30(0.29) 0.97 6213.3 10200.00
4 31126.18 36.87 1.527 0.30(0.29) 0.98 9055.7 20700.00
5 33780.51 45.14 1.363 0.30(0.29) 0.98 12356.3 10100.00
6 36202.34 52.10 1.260 0.30(0.29) 0.97 15733.9 20300.00
7 39219.73 64.33 1.143 0.30(0.29) 0.97 22422.6 31400.00
8 40865.88 74.33 1.076 0.30(0.29) 0.97 27667.4 13100.00
9 41545.04 81.36 1.028 0.30(0.29) 0.97 30790.7 11801.00
10 42916.82 91.97 0.961 0.30(0.29) 0.97 36203.9 11530.00
11 43732.25 96.23 0.943 0.30(0.29) 0.97 38850.4 11701.00
12 45368.00 104.66 0.906 0.30(0.29) 0.97 44574.1 13500.00
13 46297.64 109.54 0.885 0.30(0.29) 0.97 47867.6 10800.00
14 46706.30 113.72 0.867 0.30(0.29) 0.97 50810.3 11130.00
15 46137.39 123.35 0.833 0.30(0.29) 0.98 55849.0 12410.00
16 45391.89 131.70 0.816 0.30(0.29) 0.98 59591.1 11201.00
17 44891.63 136.71 0.805 0.30(0.29) 0.98 61320.9 12201.00
18 43794.44 143.86 0.790 0.30(0.29) 0.98 63176.2 12231.00
19 42415.30 151.81 0.774 0.30(0.29) 0.98 64812.6 10400.00
20 40985.06 159.89 0.757 0.30(0.29) 0.98 66107.2 12010.00
21 39748.94 166.00 0.744 0.30(0.29) 0.98 66455.9 10210.00
22 35330.33 194.70 0.699 0.30(0.29) 0.98 67194.1 10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13802.00 = 130408.80 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 761.98 30.47 1.693 0.30(0.28) 0.94 599.8 10400.00
LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 13802.00 = 12273.00 FEET.

** PEAK FLOW RATE TABLE **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 27702.14 24.02 1.954 0.30(0.29) 0.97 5365.1 10300.00
2 28339.56 27.08 1.817 0.30(0.29) 0.97 6041.9 21100.00
3 29052.14 28.98 1.744 0.30(0.29) 0.97 6783.9 10200.00
4 29594.23 30.47 1.693 0.30(0.29) 0.97 7347.5 10400.00
5 31798.59 36.87 1.527 0.30(0.29) 0.97 9655.5 20700.00
6 34364.23 45.14 1.363 0.30(0.29) 0.97 12956.0 10100.00
7 36730.86 52.10 1.260 0.30(0.29) 0.97 16333.7 20300.00
8 39684.77 64.33 1.143 0.30(0.29) 0.97 23022.4 31400.00
9 41294.56 74.33 1.076 0.30(0.29) 0.97 28267.2 13100.00
10 41948.14 81.36 1.028 0.30(0.29) 0.97 31390.5 11801.00
11 43283.93 91.97 0.961 0.30(0.29) 0.97 36803.6 11530.00
12 44089.38 96.23 0.943 0.30(0.29) 0.97 39450.2 11701.00
13 45705.41 104.66 0.906 0.30(0.29) 0.97 45173.8 13500.00
14 46623.64 109.54 0.885 0.30(0.29) 0.97 48467.3 10800.00
15 47022.52 113.72 0.867 0.30(0.29) 0.97 51410.1 11130.00
16 46435.14 123.35 0.833 0.30(0.29) 0.97 56448.8 12410.00
17 45680.25 131.70 0.816 0.30(0.29) 0.98 60190.9 11201.00
18 45174.36 136.71 0.805 0.30(0.29) 0.98 61920.6 12201.00
19 44069.12 143.86 0.790 0.30(0.29) 0.98 63776.0 12231.00
20 42681.04 151.81 0.774 0.30(0.29) 0.98 65412.4 10400.00
21 41241.72 159.89 0.757 0.30(0.29) 0.98 66706.9 12010.00
22 39998.72 166.00 0.744 0.30(0.29) 0.98 67055.6 10210.00
23 35555.94 194.70 0.699 0.30(0.29) 0.98 67793.9 10100.00
TOTAL AREA(ACRES) = 67793.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

```

PEAK FLOW RATE(CFS) = 47022.52 Tc(MIN.) = 113.719  
 EFFECTIVE AREA(ACRES) = 51410.06 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 67793.9  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13802.00 = 130408.80 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13802.00 TO NODE 13803.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 135.00 DOWNSTREAM(FEET) = 133.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 207.23 CHANNEL SLOPE = 0.0097  
 GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 13.59  
 CHANNEL FLOW THRU SUBAREA(CFS) = 47022.52  
 FLOW VELOCITY(FEET/SEC.) = 22.43 FLOW DEPTH(FEET) = 13.59  
 TRAVEL TIME(MIN.) = 0.15 Tc(MIN.) = 113.87  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13803.00 = 130616.03 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13802.00 TO NODE 13803.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 3 <<<<<

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 67793.9 TC(MIN.) = 113.87  
 EFFECTIVE AREA(ACRES) = 51410.06 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.973  
 PEAK FLOW RATE(CFS) = 47022.52

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	27702.14	24.20	1.943	0.30( 0.29)	0.97	5365.1	10300.00
2	28339.56	27.25	1.810	0.30( 0.29)	0.97	6041.9	21100.00
3	29052.14	29.16	1.737	0.30( 0.29)	0.97	6783.9	10200.00
4	29594.23	30.64	1.688	0.30( 0.29)	0.97	7347.5	10400.00
5	31798.59	37.05	1.523	0.30( 0.29)	0.97	9655.5	20700.00
6	34364.23	45.31	1.360	0.30( 0.29)	0.97	12956.0	10100.00
7	36730.86	52.27	1.259	0.30( 0.29)	0.97	16333.7	20300.00
8	39684.77	64.49	1.142	0.30( 0.29)	0.97	23022.4	31400.00
9	41294.56	74.49	1.074	0.30( 0.29)	0.97	28267.2	13100.00
10	41948.14	81.52	1.027	0.30( 0.29)	0.97	31390.5	11801.00
11	43283.93	92.13	0.961	0.30( 0.29)	0.97	36803.6	11530.00
12	44089.38	96.39	0.942	0.30( 0.29)	0.97	39450.2	11701.00
13	45705.41	104.82	0.906	0.30( 0.29)	0.97	45173.8	13500.00
14	46623.64	109.69	0.885	0.30( 0.29)	0.97	48467.3	10800.00
15	47022.52	113.87	0.867	0.30( 0.29)	0.97	51410.1	11130.00
16	46435.14	123.51	0.833	0.30( 0.29)	0.97	56448.8	12410.00
17	45680.25	131.86	0.815	0.30( 0.29)	0.98	60190.9	11201.00
18	45174.36	136.87	0.805	0.30( 0.29)	0.98	61920.6	12201.00
19	44069.12	144.02	0.790	0.30( 0.29)	0.98	63776.0	12231.00
20	42681.04	151.97	0.773	0.30( 0.29)	0.98	65412.4	10400.00
21	41241.72	160.05	0.757	0.30( 0.29)	0.98	66706.9	12010.00

22 39998.72 166.16 0.744 0.30( 0.29) 0.98 67055.6 10210.00  
 23 35555.94 194.87 0.699 0.30( 0.29) 0.98 67793.9 10100.00

=====  
 END OF RATIONAL METHOD ANALYSIS

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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:

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FILE NAME: S38.DAT  
TIME/DATE OF STUDY: 10:47 09/12/2017  
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--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*

NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.224
- 2) 10.00; 3.382
- 3) 15.00; 2.607
- 4) 20.00; 2.184
- 5) 25.00; 1.895
- 6) 30.00; 1.703
- 7) 40.00; 1.444
- 8) 50.00; 1.282
- 9) 60.00; 1.170
- 10) 90.00; 0.968
- 11) 120.00; 0.838
- 12) 180.00; 0.713
- 13) 360.00; 0.522
- 14) 1200.00; 0.227

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN CROSSFALL (FT)	STREET / SIDE / WAY	CROSSFALL (FT)	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 13803.00 TO NODE 13803.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<<  
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PEAK FLOWRATE TABLE FILE NAME: S37.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	29594.23	30.64	0.30 ( 0.29)	0.97	7347.5	10400.00
2	31798.59	37.05	0.30 ( 0.29)	0.97	9655.5	20700.00
3	34364.23	45.31	0.30 ( 0.29)	0.97	12956.0	10100.00
4	36730.86	52.27	0.30 ( 0.29)	0.97	16333.7	20300.00
5	39684.77	64.49	0.30 ( 0.29)	0.97	23022.4	31400.00
6	41294.56	74.49	0.30 ( 0.29)	0.97	28267.2	13100.00
7	41948.14	81.52	0.30 ( 0.29)	0.97	31390.5	11801.00
8	43283.93	92.13	0.30 ( 0.29)	0.97	36803.6	11530.00
9	44089.38	96.39	0.30 ( 0.29)	0.97	39450.2	11701.00
10	45705.41	104.82	0.30 ( 0.29)	0.97	45173.8	13500.00
11	46623.64	109.69	0.30 ( 0.29)	0.97	48467.3	10800.00
12	47022.52	113.87	0.30 ( 0.29)	0.97	51410.1	11130.00
13	46435.14	123.51	0.30 ( 0.29)	0.97	56448.8	12410.00
14	45680.25	131.86	0.30 ( 0.29)	0.98	60190.9	11201.00
15	45174.36	136.87	0.30 ( 0.29)	0.98	61920.6	12201.00
16	44069.12	144.02	0.30 ( 0.29)	0.98	63776.0	12231.00
17	42681.04	151.97	0.30 ( 0.29)	0.98	65412.4	10400.00
18	41241.72	160.05	0.30 ( 0.29)	0.98	66706.9	12010.00
19	39998.72	166.16	0.30 ( 0.29)	0.98	67055.6	10210.00
20	35555.94	194.87	0.30 ( 0.29)	0.98	67793.9	10100.00
TOTAL AREA (ACRES) =						67793.9

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FLOW PROCESS FROM NODE 13803.00 TO NODE 13803.00 IS CODE = 14.0  
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>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
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MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	29594.23	30.64	0.30 ( 0.29)	0.97	7347.5	10400.00
2	31798.59	37.05	0.30 ( 0.29)	0.97	9655.5	20700.00
3	34364.23	45.31	0.30 ( 0.29)	0.97	12956.0	10100.00
4	36730.86	52.27	0.30 ( 0.29)	0.97	16333.7	20300.00
5	39684.77	64.49	0.30 ( 0.29)	0.97	23022.4	31400.00
6	41294.56	74.49	0.30 ( 0.29)	0.97	28267.2	13100.00
7	41948.14	81.52	0.30 ( 0.29)	0.97	31390.5	11801.00
8	43283.93	92.13	0.30 ( 0.29)	0.97	36803.6	11530.00
9	44089.38	96.39	0.30 ( 0.29)	0.97	39450.2	11701.00
10	45705.41	104.82	0.30 ( 0.29)	0.97	45173.8	13500.00
11	46623.64	109.69	0.30 ( 0.29)	0.97	48467.3	10800.00
12	47022.52	113.87	0.30 ( 0.29)	0.97	51410.1	11130.00
13	46435.14	123.51	0.30 ( 0.29)	0.97	56448.8	12410.00
14	45680.25	131.86	0.30 ( 0.29)	0.98	60190.9	11201.00
15	45174.36	136.87	0.30 ( 0.29)	0.98	61920.6	12201.00
16	44069.12	144.02	0.30 ( 0.29)	0.98	63776.0	12231.00
17	42681.04	151.97	0.30 ( 0.29)	0.98	65412.4	10400.00
18	41241.72	160.05	0.30 ( 0.29)	0.98	66706.9	12010.00

19 39998.72 166.16 0.30( 0.29) 0.98 67055.6 10210.00  
20 35555.94 194.87 0.30( 0.29) 0.98 67793.9 10100.00  
TOTAL AREA (ACRES) = 67793.9

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FLOW PROCESS FROM NODE 13803.00 TO NODE 13820.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 140.00 DOWNSTREAM(FEET) = 137.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 926.91 CHANNEL SLOPE = 0.0032  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 18.03  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 0.860

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	53.70	0.30	0.983	-

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.983

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 47036.18

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.16

AVERAGE FLOW DEPTH(FEET) = 18.03 TRAVEL TIME(MIN.) = 1.02

Tc(MIN.) = 114.89

SUBAREA AREA(ACRES) = 53.70 SUBAREA RUNOFF(CFS) = 27.32

EFFECTIVE AREA(ACRES) = 51463.76 AREA-AVERAGED Fm(INCH/HR) = 0.29

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97

TOTAL AREA(ACRES) = 67847.6 PEAK FLOW RATE(CFS) = 47022.52

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 18.02

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 18.02 FLOW VELOCITY(FEET/SEC.) = 15.16

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13820.00 = 131542.94 FEET.

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FLOW PROCESS FROM NODE 13803.00 TO NODE 13820.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 114.89

RAINFALL INTENSITY(INCH/HR) = 0.86

AREA-AVERAGED Fm(INCH/HR) = 0.29

AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.97

EFFECTIVE STREAM AREA(ACRES) = 51463.76

TOTAL STREAM AREA(ACRES) = 67847.55

PEAK FLOW RATE(CFS) AT CONFLUENCE = 47022.52

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FLOW PROCESS FROM NODE 13810.00 TO NODE 13811.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 648.54  
ELEVATION DATA: UPSTREAM(FEET) = 756.46 DOWNSTREAM(FEET) = 586.02

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

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.293

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.027

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER						
"CHAPARRAL,BROADLEAF"	-	5.58	0.30	1.000	0	12.29

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

SUBAREA RUNOFF(CFS) = 13.69

TOTAL AREA(ACRES) = 5.58 PEAK FLOW RATE(CFS) = 13.69

\*\*\*\*\*

FLOW PROCESS FROM NODE 13811.00 TO NODE 13811.50 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 586.02 DOWNSTREAM(FEET) = 437.69  
CHANNEL LENGTH THRU SUBAREA(FEET) = 696.28 CHANNEL SLOPE = 0.2130  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.46

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.739

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	14.79	0.30	1.000	-

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 29.95

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.26

AVERAGE FLOW DEPTH(FEET) = 0.44 TRAVEL TIME(MIN.) = 1.85

Tc(MIN.) = 14.15

SUBAREA AREA(ACRES) = 14.79 SUBAREA RUNOFF(CFS) = 32.47

EFFECTIVE AREA(ACRES) = 20.37 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 20.4 PEAK FLOW RATE(CFS) = 44.72

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.56

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.56 FLOW VELOCITY(FEET/SEC.) = 7.18

LONGEST FLOWPATH FROM NODE 13810.00 TO NODE 13811.50 = 1344.82 FEET.

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FLOW PROCESS FROM NODE 13811.50 TO NODE 13812.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<



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ELEVATION DATA: UPSTREAM(FEET) = 437.69 DOWNSTREAM(FEET) = 402.36
CHANNEL LENGTH THRU SUBAREA(FEET) = 681.04 CHANNEL SLOPE = 0.0519
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.05
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.490
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/    SCS SOIL  AREA    Fp      Ap    SCS
    LAND USE          GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED          -      18.41   0.30   1.000   -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 62.88
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.08
AVERAGE FLOW DEPTH(FEET) = 1.03 TRAVEL TIME(MIN.) = 2.23
Tc(MIN.) = 16.38
SUBAREA AREA(ACRES) = 18.41 SUBAREA RUNOFF(CFS) = 36.29
EFFECTIVE AREA(ACRES) = 38.78 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 38.8 PEAK FLOW RATE(CFS) = 76.44
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.15

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.15 FLOW VELOCITY(FEET/SEC.) = 5.41
LONGEST FLOWPATH FROM NODE 13810.00 TO NODE 13812.00 = 2025.86 FEET.

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FLOW PROCESS FROM NODE 13812.00 TO NODE 13813.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 402.36 DOWNSTREAM(FEET) = 259.72
CHANNEL LENGTH THRU SUBAREA(FEET) = 1282.56 CHANNEL SLOPE = 0.1112
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.10
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.254
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/    SCS SOIL  AREA    Fp      Ap    SCS
    LAND USE          GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED          -      27.87   0.30   0.858   -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.858
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 101.51
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.66
AVERAGE FLOW DEPTH(FEET) = 1.09 TRAVEL TIME(MIN.) = 2.79
Tc(MIN.) = 19.17
SUBAREA AREA(ACRES) = 27.87 SUBAREA RUNOFF(CFS) = 50.08
EFFECTIVE AREA(ACRES) = 66.65 AREA-AVERAGED Fm(INCH/HR) = 0.28
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.94
TOTAL AREA(ACRES) = 66.7 PEAK FLOW RATE(CFS) = 118.29
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.19

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.19 FLOW VELOCITY(FEET/SEC.) = 8.05
LONGEST FLOWPATH FROM NODE 13810.00 TO NODE 13813.00 = 3308.42 FEET.

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FLOW PROCESS FROM NODE 13813.00 TO NODE 13820.00 IS CODE = 31
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>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 259.72 DOWNSTREAM(FEET) = 137.00
FLOW LENGTH(FEET) = 2412.88 MANNING'S N = 0.013
DEPTH OF FLOW IN 36.0 INCH PIPE IS 25.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 22.57
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 118.29
PIPE TRAVEL TIME(MIN.) = 1.78 Tc(MIN.) = 20.95
LONGEST FLOWPATH FROM NODE 13810.00 TO NODE 13820.00 = 5721.30 FEET.

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FLOW PROCESS FROM NODE 13813.00 TO NODE 13820.00 IS CODE = 81
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>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<

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MAINLINE Tc(MIN.) = 20.95
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.129
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/    SCS SOIL  AREA    Fp      Ap    SCS
    LAND USE          GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED          -      82.54   0.30   0.570   -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.570
SUBAREA AREA(ACRES) = 82.54 SUBAREA RUNOFF(CFS) = 145.45
EFFECTIVE AREA(ACRES) = 149.19 AREA-AVERAGED Fm(INCH/HR) = 0.22
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.74
TOTAL AREA(ACRES) = 149.2 PEAK FLOW RATE(CFS) = 256.23

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FLOW PROCESS FROM NODE 13813.00 TO NODE 13820.00 IS CODE = 1
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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

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TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 20.95
RAINFALL INTENSITY(INCH/HR) = 2.13
AREA-AVERAGED Fm(INCH/HR) = 0.22
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.74
EFFECTIVE STREAM AREA(ACRES) = 149.19
TOTAL STREAM AREA(ACRES) = 149.19
PEAK FLOW RATE(CFS) AT CONFLUENCE = 256.23

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** CONFLUENCE DATA **

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STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
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1	29594.23	31.81	1.656	0.30	( 0.29)	0.97	7401.2	10400.00
1	31798.59	38.18	1.491	0.30	( 0.29)	0.97	9709.2	20700.00
1	34364.23	46.42	1.340	0.30	( 0.29)	0.97	13009.7	10100.00
1	36730.86	53.36	1.244	0.30	( 0.29)	0.97	16387.4	20300.00
1	39684.77	65.56	1.133	0.30	( 0.29)	0.97	23076.1	31400.00
1	41294.56	75.54	1.065	0.30	( 0.29)	0.97	28320.9	13100.00
1	41948.14	82.58	1.018	0.30	( 0.29)	0.97	31444.2	11801.00
1	43283.93	93.17	0.954	0.30	( 0.29)	0.97	36857.3	11530.00
1	44089.38	97.43	0.936	0.30	( 0.29)	0.97	39503.9	11701.00
1	45705.41	105.84	0.899	0.30	( 0.29)	0.97	45227.5	13500.00
1	46623.64	110.71	0.878	0.30	( 0.29)	0.97	48521.0	10800.00
1	47022.52	114.89	0.860	0.30	( 0.29)	0.97	51463.8	11130.00
1	46435.14	124.53	0.829	0.30	( 0.29)	0.97	56502.5	12410.00
1	45680.25	132.89	0.811	0.30	( 0.29)	0.98	60244.6	11201.00
1	45174.36	137.90	0.801	0.30	( 0.29)	0.98	61974.3	12201.00
1	44069.12	145.06	0.786	0.30	( 0.29)	0.98	63829.7	12231.00
1	42681.04	153.02	0.769	0.30	( 0.29)	0.98	65466.1	10400.00
1	41241.72	161.11	0.752	0.30	( 0.29)	0.98	66760.6	12010.00
1	39998.72	167.23	0.740	0.30	( 0.29)	0.98	67109.3	10210.00
1	35555.94	195.97	0.696	0.30	( 0.29)	0.98	67847.6	10100.00
2	256.23	20.95	2.129	0.30	( 0.22)	0.74	149.2	13810.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26505.51	20.95	2.129	0.30 ( 0.29)	0.97	5025.0	13810.00
2	29786.99	31.81	1.656	0.30 ( 0.29)	0.97	7550.4	10400.00
3	31969.17	38.18	1.491	0.30 ( 0.29)	0.97	9858.4	20700.00
4	34514.52	46.42	1.340	0.30 ( 0.29)	0.97	13158.9	10100.00
5	36868.31	53.36	1.244	0.30 ( 0.29)	0.97	16536.6	20300.00
6	39807.22	65.56	1.133	0.30 ( 0.29)	0.97	23225.3	31400.00
7	41407.98	75.54	1.065	0.30 ( 0.29)	0.96	28470.1	13100.00
8	42055.20	82.58	1.018	0.30 ( 0.29)	0.96	31593.4	11801.00
9	43382.43	93.17	0.954	0.30 ( 0.29)	0.97	37006.5	11530.00
10	44185.41	97.43	0.936	0.30 ( 0.29)	0.97	39653.1	11701.00
11	45796.54	105.84	0.899	0.30 ( 0.29)	0.97	45376.7	13500.00
12	46711.94	110.71	0.878	0.30 ( 0.29)	0.97	48670.2	10800.00
13	47108.38	114.89	0.860	0.30 ( 0.29)	0.97	51612.9	11130.00
14	46516.77	124.53	0.829	0.30 ( 0.29)	0.97	56651.7	12410.00
15	45759.55	132.89	0.811	0.30 ( 0.29)	0.97	60393.8	11201.00
16	45252.25	137.90	0.801	0.30 ( 0.29)	0.97	62123.5	12201.00
17	44145.01	145.06	0.786	0.30 ( 0.29)	0.98	63978.9	12231.00
18	42754.70	153.02	0.769	0.30 ( 0.29)	0.98	65615.3	10400.00
19	41313.11	161.11	0.752	0.30 ( 0.29)	0.98	66909.8	12010.00
20	40068.41	167.23	0.740	0.30 ( 0.29)	0.98	67258.5	10210.00
21	35619.78	195.97	0.696	0.30 ( 0.29)	0.98	67996.7	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 47108.38 Tc(MIN.) = 114.89  
EFFECTIVE AREA(ACRES) = 51612.95 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA(ACRES) = 67996.7  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13820.00 = 131542.94 FEET.

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FLOW PROCESS FROM NODE 13820.00 TO NODE 13840.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 137.00 DOWNSTREAM(FEET) = 133.00

CHANNEL LENGTH THRU SUBAREA(FEET) = 1261.34 CHANNEL SLOPE = 0.0032

GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 18.14

\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 0.854

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	31.60	0.30	0.683	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 47117.61

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.05

AVERAGE FLOW DEPTH(FEET) = 18.14 TRAVEL TIME(MIN.) = 1.40

Tc(MIN.) = 116.29

SUBAREA AREA(ACRES) = 31.60 SUBAREA RUNOFF(CFS) = 18.46

EFFECTIVE AREA(ACRES) = 51644.55 AREA-AVERAGED Fm(INCH/HR) = 0.29

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97

TOTAL AREA(ACRES) = 68028.3 PEAK FLOW RATE(CFS) = 47108.38

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 18.13

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 18.13 FLOW VELOCITY(FEET/SEC.) = 15.06

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13840.00 = 132804.28 FEET.

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FLOW PROCESS FROM NODE 13820.00 TO NODE 13840.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 116.29

RAINFALL INTENSITY(INCH/HR) = 0.85

AREA-AVERAGED Fm(INCH/HR) = 0.29

AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.97

EFFECTIVE STREAM AREA(ACRES) = 51644.55

TOTAL STREAM AREA(ACRES) = 68028.34

PEAK FLOW RATE(CFS) AT CONFLUENCE = 47108.38

\*\*\*\*\*

FLOW PROCESS FROM NODE 13830.00 TO NODE 13831.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 744.71

ELEVATION DATA: UPSTREAM(FEET) = 1100.95 DOWNSTREAM(FEET) = 959.21

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.858  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.784  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	5.06	0.30	1.000	0	13.86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 11.31  
 TOTAL AREA(ACRES) = 5.06 PEAK FLOW RATE(CFS) = 11.31

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13831.00 TO NODE 13832.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 959.21 DOWNSTREAM(FEET) = 832.83  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1076.71 CHANNEL SLOPE = 0.1174  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.69  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.443  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	32.57	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 42.87  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.82  
 AVERAGE FLOW DEPTH(FEET) = 0.65 TRAVEL TIME(MIN.) = 3.08  
 Tc(MIN.) = 16.94

SUBAREA AREA(ACRES) = 32.57 SUBAREA RUNOFF(CFS) = 62.82  
 EFFECTIVE AREA(ACRES) = 37.63 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 37.6 PEAK FLOW RATE(CFS) = 72.58  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.88

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.88 FLOW VELOCITY(FEET/SEC.) = 6.99  
 LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13832.00 = 1821.42 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13832.00 TO NODE 13833.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 832.83 DOWNSTREAM(FEET) = 572.49  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1883.58 CHANNEL SLOPE = 0.1382  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.03  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.139  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	32.23	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 99.30  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.18  
 AVERAGE FLOW DEPTH(FEET) = 1.01 TRAVEL TIME(MIN.) = 3.84  
 Tc(MIN.) = 20.78  
 SUBAREA AREA(ACRES) = 32.23 SUBAREA RUNOFF(CFS) = 53.35  
 EFFECTIVE AREA(ACRES) = 69.86 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 69.9 PEAK FLOW RATE(CFS) = 115.63  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.10

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.10 FLOW VELOCITY(FEET/SEC.) = 8.59  
 LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13833.00 = 3705.00 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13833.00 TO NODE 13834.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 572.49 DOWNSTREAM(FEET) = 471.65  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 943.78 CHANNEL SLOPE = 0.1068  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.32  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.030  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	27.51	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 137.05  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.31  
 AVERAGE FLOW DEPTH(FEET) = 1.31 TRAVEL TIME(MIN.) = 1.89  
 Tc(MIN.) = 22.67

SUBAREA AREA(ACRES) = 27.51 SUBAREA RUNOFF(CFS) = 42.83  
 EFFECTIVE AREA(ACRES) = 97.37 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 97.4 PEAK FLOW RATE(CFS) = 151.58  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.38

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.38 FLOW VELOCITY(FEET/SEC.) = 8.58  
 LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13834.00 = 4648.78 FEET.

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FLOW PROCESS FROM NODE 13834.00 TO NODE 13835.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 471.65 DOWNSTREAM(FEET) = 347.06
CHANNEL LENGTH THRU SUBAREA(FEET) = 1647.45 CHANNEL SLOPE = 0.0756
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.90
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.861
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 94.21 0.30 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 217.79
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.51
AVERAGE FLOW DEPTH(FEET) = 1.86 TRAVEL TIME(MIN.) = 3.23
Tc(MIN.) = 25.90
SUBAREA AREA(ACRES) = 94.21 SUBAREA RUNOFF(CFS) = 132.32
EFFECTIVE AREA(ACRES) = 191.58 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 191.6 PEAK FLOW RATE(CFS) = 269.08
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.09

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.09 FLOW VELOCITY(FEET/SEC.) = 9.06
LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13835.00 = 6296.23 FEET.

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FLOW PROCESS FROM NODE 13835.00 TO NODE 13836.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 347.06 DOWNSTREAM(FEET) = 269.29
CHANNEL LENGTH THRU SUBAREA(FEET) = 1696.71 CHANNEL SLOPE = 0.0458
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.09
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.734
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 233.25 0.30 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 419.75
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.61
AVERAGE FLOW DEPTH(FEET) = 3.03 TRAVEL TIME(MIN.) = 3.28
Tc(MIN.) = 29.18
SUBAREA AREA(ACRES) = 233.25 SUBAREA RUNOFF(CFS) = 301.14
EFFECTIVE AREA(ACRES) = 424.83 AREA-AVERAGED Fm(INCH/HR) = 0.30

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AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 424.8 PEAK FLOW RATE(CFS) = 548.48
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.48

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.48 FLOW VELOCITY(FEET/SEC.) = 9.28
LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13836.00 = 7992.94 FEET.

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FLOW PROCESS FROM NODE 13836.00 TO NODE 13837.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 269.29 DOWNSTREAM(FEET) = 191.87
CHANNEL LENGTH THRU SUBAREA(FEET) = 2529.21 CHANNEL SLOPE = 0.0306
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 4.16
* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.593
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 134.70 0.30 0.880 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.880
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 629.05
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.31
AVERAGE FLOW DEPTH(FEET) = 4.14 TRAVEL TIME(MIN.) = 5.07
Tc(MIN.) = 34.25
SUBAREA AREA(ACRES) = 134.70 SUBAREA RUNOFF(CFS) = 161.11
EFFECTIVE AREA(ACRES) = 559.53 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 559.5 PEAK FLOW RATE(CFS) = 655.45
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 4.23

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 4.23 FLOW VELOCITY(FEET/SEC.) = 8.40
LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13837.00 = 10522.15 FEET.

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FLOW PROCESS FROM NODE 13837.00 TO NODE 13840.00 IS CODE = 31
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>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 191.87 DOWNSTREAM(FEET) = 133.00
FLOW LENGTH(FEET) = 1151.02 MANNING'S N = 0.013
DEPTH OF FLOW IN 66.0 INCH PIPE IS 49.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 34.36
ESTIMATED PIPE DIAMETER(INCH) = 66.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 655.45
PIPE TRAVEL TIME(MIN.) = 0.56 Tc(MIN.) = 34.81
LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13840.00 = 11673.17 FEET.

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\*\*\*\*\*  
FLOW PROCESS FROM NODE 13837.00 TO NODE 13840.00 IS CODE = 81

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

MAINLINE Tc(MIN.) = 34.81  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 1.578  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 5.97 0.30 0.622 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.622  
SUBAREA AREA(ACRES) = 5.97 SUBAREA RUNOFF(CFS) = 7.48  
EFFECTIVE AREA(ACRES) = 565.50 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA(ACRES) = 565.5 PEAK FLOW RATE(CFS) = 655.65

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13837.00 TO NODE 13840.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION(MIN.) = 34.81  
RAINFALL INTENSITY(INCH/HR) = 1.58  
AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.97  
EFFECTIVE STREAM AREA(ACRES) = 565.50  
TOTAL STREAM AREA(ACRES) = 565.50  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 655.65

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26505.51	22.60	2.034	0.30( 0.29)	0.96	5056.6	13810.00
1	29786.99	33.39	1.615	0.30( 0.29)	0.97	7582.0	10400.00
1	31969.17	39.74	1.451	0.30( 0.29)	0.97	9890.0	20700.00
1	34514.52	47.95	1.315	0.30( 0.29)	0.97	13190.5	10100.00
1	36868.31	54.86	1.228	0.30( 0.29)	0.97	16568.2	20300.00
1	39807.22	67.02	1.123	0.30( 0.29)	0.97	23256.9	31400.00
1	41407.98	76.99	1.056	0.30( 0.29)	0.96	28501.7	13100.00
1	42055.20	84.02	1.008	0.30( 0.29)	0.96	31625.0	11801.00
1	43382.43	94.60	0.948	0.30( 0.29)	0.97	37038.1	11530.00
1	44185.41	98.85	0.930	0.30( 0.29)	0.97	39684.7	11701.00
1	45796.54	107.25	0.893	0.30( 0.29)	0.97	45408.3	13500.00
1	46711.94	112.11	0.872	0.30( 0.29)	0.97	48701.8	10800.00
1	47108.38	116.29	0.854	0.30( 0.29)	0.97	51644.6	11130.00
1	46516.77	125.93	0.826	0.30( 0.29)	0.97	56683.3	12410.00
1	45759.55	134.29	0.808	0.30( 0.29)	0.97	60425.4	11201.00
1	45252.25	139.31	0.798	0.30( 0.29)	0.97	62155.1	12201.00
1	44145.01	146.48	0.783	0.30( 0.29)	0.97	64010.5	12231.00
1	42754.70	154.45	0.766	0.30( 0.29)	0.98	65646.9	10400.00
1	41313.11	162.56	0.749	0.30( 0.29)	0.98	66941.4	12010.00

1	40068.41	168.69	0.737	0.30( 0.29)	0.98	67290.1	10210.00
1	35619.78	197.48	0.694	0.30( 0.29)	0.98	68028.3	10100.00
2	655.65	34.81	1.578	0.30( 0.29)	0.97	565.5	13830.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	27081.61	22.60	2.034	0.30( 0.29)	0.96	5423.7	13810.00
2	30433.88	33.39	1.615	0.30( 0.29)	0.97	8124.5	10400.00
3	30929.51	34.81	1.578	0.30( 0.29)	0.97	8662.5	13830.00
4	32559.84	39.74	1.451	0.30( 0.29)	0.97	10455.5	20700.00
5	35036.25	47.95	1.315	0.30( 0.29)	0.97	13756.0	10100.00
6	37345.43	54.86	1.228	0.30( 0.29)	0.97	17133.7	20300.00
7	40230.96	67.02	1.123	0.30( 0.29)	0.97	23822.4	31400.00
8	41797.55	76.99	1.056	0.30( 0.29)	0.96	29067.2	13100.00
9	42420.69	84.02	1.008	0.30( 0.29)	0.96	32190.5	11801.00
10	43717.28	94.60	0.948	0.30( 0.29)	0.97	37603.6	11530.00
11	44510.88	98.85	0.930	0.30( 0.29)	0.97	40250.2	11701.00
12	46103.48	107.25	0.893	0.30( 0.29)	0.97	45973.8	13500.00
13	47008.15	112.11	0.872	0.30( 0.29)	0.97	49267.3	10800.00
14	47395.39	116.29	0.854	0.30( 0.29)	0.97	52210.1	11130.00
15	46789.30	125.93	0.826	0.30( 0.29)	0.97	57248.8	12410.00
16	46023.21	134.29	0.808	0.30( 0.29)	0.97	60990.9	11201.00
17	45510.59	139.31	0.798	0.30( 0.29)	0.97	62720.6	12201.00
18	44395.75	146.48	0.783	0.30( 0.29)	0.97	64576.0	12231.00
19	42997.00	154.45	0.766	0.30( 0.29)	0.98	66212.4	10400.00
20	41546.81	162.56	0.749	0.30( 0.29)	0.98	67506.9	12010.00
21	40295.60	168.69	0.737	0.30( 0.29)	0.98	67855.6	10210.00
22	35825.54	197.48	0.694	0.30( 0.29)	0.98	68593.8	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 47395.39 Tc(MIN.) = 116.29  
EFFECTIVE AREA(ACRES) = 52210.05 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA(ACRES) = 68593.8  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13840.00 = 132804.28 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13840.00 TO NODE 13860.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 133.00 DOWNSTREAM(FEET) = 130.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 654.44 CHANNEL SLOPE = 0.0046  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 16.56  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 0.851  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 6.61 0.30 0.975 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.975

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 47397.05  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 17.22  
 AVERAGE FLOW DEPTH(FEET) = 16.56 TRAVEL TIME(MIN.) = 0.63  
 Tc(MIN.) = 116.92  
 SUBAREA AREA(ACRES) = 6.61 SUBAREA RUNOFF(CFS) = 3.32  
 EFFECTIVE AREA(ACRES) = 52216.66 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 68600.5 PEAK FLOW RATE(CFS) = 47395.39  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 16.56

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 16.56 FLOW VELOCITY(FEET/SEC.) = 17.22  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13860.00 = 133458.72 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13840.00 TO NODE 13860.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

-----  
 TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 116.92  
 RAINFALL INTENSITY(INCH/HR) = 0.85  
 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.97  
 EFFECTIVE STREAM AREA(ACRES) = 52216.66  
 TOTAL STREAM AREA(ACRES) = 68600.45  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 47395.39

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13850.00 TO NODE 13851.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 617.57  
 ELEVATION DATA: UPSTREAM(FEET) = 646.95 DOWNSTREAM(FEET) = 490.10

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.137  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.051  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	4.95	0.30	1.000	0	12.14

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 12.25  
 TOTAL AREA(ACRES) = 4.95 PEAK FLOW RATE(CFS) = 12.25

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13851.00 TO NODE 13851.50 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 490.10 DOWNSTREAM(FEET) = 440.98  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 351.14 CHANNEL SLOPE = 0.1399  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.36  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.846

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	4.02	0.30	1.000	-

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.86  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.43  
 AVERAGE FLOW DEPTH(FEET) = 0.36 TRAVEL TIME(MIN.) = 1.32  
 Tc(MIN.) = 13.46

SUBAREA AREA(ACRES) = 4.02 SUBAREA RUNOFF(CFS) = 9.21  
 EFFECTIVE AREA(ACRES) = 8.97 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 9.0 PEAK FLOW RATE(CFS) = 20.55  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.40

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.40 FLOW VELOCITY(FEET/SEC.) = 4.74  
 LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13851.50 = 968.71 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13851.50 TO NODE 13852.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 440.98 DOWNSTREAM(FEET) = 395.76  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 512.91 CHANNEL SLOPE = 0.0882  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.56  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.578

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	7.17	0.30	1.000	-

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 27.91  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.55  
 AVERAGE FLOW DEPTH(FEET) = 0.55 TRAVEL TIME(MIN.) = 1.88  
 Tc(MIN.) = 15.34

SUBAREA AREA(ACRES) = 7.17 SUBAREA RUNOFF(CFS) = 14.70  
 EFFECTIVE AREA(ACRES) = 16.14 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 16.1 PEAK FLOW RATE(CFS) = 33.10  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.61  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.61 FLOW VELOCITY (FEET/SEC.) = 4.86  
 LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13852.00 = 1481.62 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13852.00 TO NODE 13853.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 395.76 DOWNSTREAM (FEET) = 354.94  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 443.69 CHANNEL SLOPE = 0.0920  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.67  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.459  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	6.76	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 39.67  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.23  
 AVERAGE FLOW DEPTH (FEET) = 0.67 TRAVEL TIME (MIN.) = 1.41  
 Tc (MIN.) = 16.75  
 SUBAREA AREA (ACRES) = 6.76 SUBAREA RUNOFF (CFS) = 13.14  
 EFFECTIVE AREA (ACRES) = 22.90 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 22.9 PEAK FLOW RATE (CFS) = 44.50  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.71

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.71 FLOW VELOCITY (FEET/SEC.) = 5.45  
 LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13853.00 = 1925.31 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13853.00 TO NODE 13854.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 354.94 DOWNSTREAM (FEET) = 263.57  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 962.09 CHANNEL SLOPE = 0.0950  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.86  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.237  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.16	0.30	1.000	-

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 60.34  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.12  
 AVERAGE FLOW DEPTH (FEET) = 0.84 TRAVEL TIME (MIN.) = 2.62  
 Tc (MIN.) = 19.37  
 SUBAREA AREA (ACRES) = 18.16 SUBAREA RUNOFF (CFS) = 31.66  
 EFFECTIVE AREA (ACRES) = 41.06 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 41.1 PEAK FLOW RATE (CFS) = 71.59  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.93

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.93 FLOW VELOCITY (FEET/SEC.) = 6.46  
 LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13854.00 = 2887.40 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13854.00 TO NODE 13855.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 263.57 DOWNSTREAM (FEET) = 188.74  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1228.77 CHANNEL SLOPE = 0.0609  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.32  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.031  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	38.75	0.30	0.879	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.879  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 102.43  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.25  
 AVERAGE FLOW DEPTH (FEET) = 1.30 TRAVEL TIME (MIN.) = 3.27  
 Tc (MIN.) = 22.65  
 SUBAREA AREA (ACRES) = 38.75 SUBAREA RUNOFF (CFS) = 61.64  
 EFFECTIVE AREA (ACRES) = 79.81 AREA-AVERAGED Fm (INCH/HR) = 0.28  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.94  
 TOTAL AREA (ACRES) = 79.8 PEAK FLOW RATE (CFS) = 125.61  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.46

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.46 FLOW VELOCITY (FEET/SEC.) = 6.66  
 LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13855.00 = 4116.17 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13855.00 TO NODE 13860.00 IS CODE = 31  
 -----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 188.74 DOWNSTREAM (FEET) = 130.00

FLOW LENGTH(FEET) = 2092.67 MANNING'S N = 0.013  
 DEPTH OF FLOW IN 39.0 INCH PIPE IS 30.6 INCHES  
 PIPE-FLOW VELOCITY(FEET/SEC.) = 18.01  
 ESTIMATED PIPE DIAMETER(INCH) = 39.00 NUMBER OF PIPES = 1  
 PIPE-FLOW(CFS) = 125.61  
 PIPE TRAVEL TIME(MIN.) = 1.94 Tc(MIN.) = 24.58  
 LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13860.00 = 6208.84 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13855.00 TO NODE 13860.00 IS CODE = 81  
 -----

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

=====

MAINLINE Tc(MIN.) = 24.58  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.919  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	43.41	0.30	0.707	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.707  
 SUBAREA AREA(ACRES) = 43.41 SUBAREA RUNOFF(CFS) = 66.69  
 EFFECTIVE AREA(ACRES) = 123.22 AREA-AVERAGED Fm(INCH/HR) = 0.26  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.86  
 TOTAL AREA(ACRES) = 123.2 PEAK FLOW RATE(CFS) = 184.26

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13855.00 TO NODE 13860.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 24.58  
 RAINFALL INTENSITY(INCH/HR) = 1.92  
 AREA-AVERAGED Fm(INCH/HR) = 0.26  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.86  
 EFFECTIVE STREAM AREA(ACRES) = 123.22  
 TOTAL STREAM AREA(ACRES) = 123.22  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 184.26

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	27081.61	23.34	1.991	0.30( 0.29)	0.96	5430.3	13810.00
1	30433.88	34.11	1.596	0.30( 0.29)	0.97	8131.1	10400.00
1	30929.51	35.53	1.560	0.30( 0.29)	0.97	8669.1	13830.00
1	32559.84	40.45	1.437	0.30( 0.29)	0.97	10462.1	20700.00
1	35036.25	48.64	1.304	0.30( 0.29)	0.97	13762.6	10100.00
1	37345.43	55.53	1.220	0.30( 0.29)	0.97	17140.3	20300.00
1	40230.96	67.68	1.118	0.30( 0.29)	0.97	23829.0	31400.00
1	41797.55	77.65	1.051	0.30( 0.29)	0.96	29073.8	13100.00
1	42420.69	84.67	1.004	0.30( 0.29)	0.96	32197.1	11801.00
1	43717.28	95.25	0.945	0.30( 0.29)	0.97	37610.2	11530.00
1	44510.88	99.49	0.927	0.30( 0.29)	0.97	40256.8	11701.00
1	46103.48	107.89	0.890	0.30( 0.29)	0.97	45980.4	13500.00

1	47008.15	112.75	0.869	0.30( 0.29)	0.97	49273.9	10800.00
1	47395.39	116.92	0.851	0.30( 0.29)	0.97	52216.7	11130.00
1	46789.30	126.57	0.824	0.30( 0.29)	0.97	57255.4	12410.00
1	46023.21	134.93	0.807	0.30( 0.29)	0.97	60997.5	11201.00
1	45510.59	139.95	0.796	0.30( 0.29)	0.97	62727.2	12201.00
1	44395.75	147.12	0.781	0.30( 0.29)	0.97	64582.6	12231.00
1	42997.00	155.10	0.765	0.30( 0.29)	0.98	66219.0	10400.00
1	41546.81	163.22	0.748	0.30( 0.29)	0.98	67513.5	12010.00
1	40295.60	169.35	0.735	0.30( 0.29)	0.98	67862.2	10210.00
1	35825.54	198.17	0.694	0.30( 0.29)	0.98	68600.5	10100.00
2	184.26	24.58	1.919	0.30( 0.26)	0.86	123.2	13850.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	27264.12	23.34	1.991	0.30( 0.29)	0.96	5547.3	13810.00
2	27652.51	24.58	1.919	0.30( 0.29)	0.96	5865.0	13850.00
3	30582.36	34.11	1.596	0.30( 0.29)	0.96	8254.4	10400.00
4	31073.93	35.53	1.560	0.30( 0.29)	0.97	8792.3	13830.00
5	32690.61	40.45	1.437	0.30( 0.29)	0.97	10585.3	20700.00
6	35152.31	48.64	1.304	0.30( 0.29)	0.97	13885.9	10100.00
7	37452.16	55.53	1.220	0.30( 0.29)	0.97	17263.5	20300.00
8	40326.41	67.68	1.118	0.30( 0.29)	0.97	23952.2	31400.00
9	41885.56	77.65	1.051	0.30( 0.29)	0.96	29197.0	13100.00
10	42503.46	84.67	1.004	0.30( 0.29)	0.96	32320.3	11801.00
11	43793.54	95.25	0.945	0.30( 0.29)	0.96	37733.5	11530.00
12	44585.11	99.49	0.927	0.30( 0.29)	0.97	40380.0	11701.00
13	46173.68	107.89	0.890	0.30( 0.29)	0.97	46103.7	13500.00
14	47076.01	112.75	0.869	0.30( 0.29)	0.97	49397.2	10800.00
15	47461.24	116.92	0.851	0.30( 0.29)	0.97	52339.9	11130.00
16	46852.16	126.57	0.824	0.30( 0.29)	0.97	57378.6	12410.00
17	46084.13	134.93	0.807	0.30( 0.29)	0.97	61120.7	11201.00
18	45570.36	139.95	0.796	0.30( 0.29)	0.97	62850.5	12201.00
19	44453.86	147.12	0.781	0.30( 0.29)	0.97	64705.8	12231.00
20	43053.26	155.10	0.765	0.30( 0.29)	0.97	66342.2	10400.00
21	41601.20	163.22	0.748	0.30( 0.29)	0.98	67636.8	12010.00
22	40348.57	169.35	0.735	0.30( 0.29)	0.98	67985.5	10210.00
23	35873.91	198.17	0.694	0.30( 0.29)	0.98	68723.7	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 47461.24 Tc(MIN.) = 116.92  
 EFFECTIVE AREA(ACRES) = 52339.88 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 68723.7  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13860.00 = 133458.72 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13860.00 TO NODE 13880.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 130.00 DOWNSTREAM(FEET) = 120.57  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 610.77 CHANNEL SLOPE = 0.0154  
 GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0



"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 12.06  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 0.850  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 4.89 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 47462.45  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 26.56  
 AVERAGE FLOW DEPTH(FEET) = 12.06 TRAVEL TIME(MIN.) = 0.38  
 Tc(MIN.) = 117.31  
 SUBAREA AREA(ACRES) = 4.89 SUBAREA RUNOFF(CFS) = 2.42  
 EFFECTIVE AREA(ACRES) = 52344.77 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 68728.6 PEAK FLOW RATE(CFS) = 47461.24  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 12.06  
  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 12.06 FLOW VELOCITY(FEET/SEC.) = 26.56  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13880.00 = 134069.48 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13860.00 TO NODE 13880.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

-----  
 TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 117.31  
 RAINFALL INTENSITY(INCH/HR) = 0.85  
 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.97  
 EFFECTIVE STREAM AREA(ACRES) = 52344.77  
 TOTAL STREAM AREA(ACRES) = 68728.56  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 47461.24

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13870.00 TO NODE 13871.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 872.65  
 ELEVATION DATA: UPSTREAM(FEET) = 558.52 DOWNSTREAM(FEET) = 436.47

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 15.704  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.547

SUBAREA Tc AND LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
 NATURAL FAIR COVER

"GRASS" - 9.32 0.30 1.000 0 15.70  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 18.85  
 TOTAL AREA(ACRES) = 9.32 PEAK FLOW RATE(CFS) = 18.85

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13871.00 TO NODE 13872.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 436.47 DOWNSTREAM(FEET) = 337.62  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 827.95 CHANNEL SLOPE = 0.1194  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.56  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.326

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 14.27 0.30 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.88  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.28  
 AVERAGE FLOW DEPTH(FEET) = 0.54 TRAVEL TIME(MIN.) = 2.61  
 Tc(MIN.) = 18.32

SUBAREA AREA(ACRES) = 14.27 SUBAREA RUNOFF(CFS) = 26.03  
 EFFECTIVE AREA(ACRES) = 23.59 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 23.6 PEAK FLOW RATE(CFS) = 43.02  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.65

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.65 FLOW VELOCITY(FEET/SEC.) = 5.84  
 LONGEST FLOWPATH FROM NODE 13870.00 TO NODE 13872.00 = 1700.60 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13872.00 TO NODE 13873.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 337.62 DOWNSTREAM(FEET) = 253.88  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1049.16 CHANNEL SLOPE = 0.0798  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.01  
 \* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.116

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 35.74 0.30 0.923 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.923

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 72.65  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.13  
AVERAGE FLOW DEPTH(FEET) = 0.99 TRAVEL TIME(MIN.) = 2.85  
Tc(MIN.) = 21.17  
SUBAREA AREA(ACRES) = 35.74 SUBAREA RUNOFF(CFS) = 59.17  
EFFECTIVE AREA(ACRES) = 59.33 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.95  
TOTAL AREA(ACRES) = 59.3 PEAK FLOW RATE(CFS) = 97.74  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.17

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.17 FLOW VELOCITY(FEET/SEC.) = 6.76  
LONGEST FLOWPATH FROM NODE 13870.00 TO NODE 13873.00 = 2749.76 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13873.00 TO NODE 13874.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 253.88 DOWNSTREAM(FEET) = 160.73  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1518.60 CHANNEL SLOPE = 0.0613  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.15  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.949

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 32.43 0.30 0.900 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.900  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 122.26  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.74  
AVERAGE FLOW DEPTH(FEET) = 1.14 TRAVEL TIME(MIN.) = 2.90  
Tc(MIN.) = 24.07

SUBAREA AREA(ACRES) = 32.43 SUBAREA RUNOFF(CFS) = 49.01  
EFFECTIVE AREA(ACRES) = 91.76 AREA-AVERAGED Fm(INCH/HR) = 0.28  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.93  
TOTAL AREA(ACRES) = 91.8 PEAK FLOW RATE(CFS) = 137.81  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.22 FLOW VELOCITY(FEET/SEC.) = 9.10  
LONGEST FLOWPATH FROM NODE 13870.00 TO NODE 13874.00 = 4268.36 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13874.00 TO NODE 13875.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 160.73 DOWNSTREAM(FEET) = 158.14  
CHANNEL LENGTH THRU SUBAREA(FEET) = 582.74 CHANNEL SLOPE = 0.0044

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.01  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.837

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 73.67 0.30 0.930 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.930  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 189.48  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.98  
AVERAGE FLOW DEPTH(FEET) = 2.98 TRAVEL TIME(MIN.) = 2.44  
Tc(MIN.) = 26.50

SUBAREA AREA(ACRES) = 73.67 SUBAREA RUNOFF(CFS) = 103.32  
EFFECTIVE AREA(ACRES) = 165.43 AREA-AVERAGED Fm(INCH/HR) = 0.28  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.93  
TOTAL AREA(ACRES) = 165.4 PEAK FLOW RATE(CFS) = 231.90  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.31

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.31 FLOW VELOCITY(FEET/SEC.) = 4.21  
LONGEST FLOWPATH FROM NODE 13870.00 TO NODE 13875.00 = 4851.10 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13875.00 TO NODE 13880.00 IS CODE = 31

-----  
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 158.14 DOWNSTREAM(FEET) = 120.57  
FLOW LENGTH(FEET) = 1855.67 MANNING'S N = 0.013  
DEPTH OF FLOW IN 54.0 INCH PIPE IS 39.1 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 18.81  
ESTIMATED PIPE DIAMETER(INCH) = 54.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 231.90  
PIPE TRAVEL TIME(MIN.) = 1.64 Tc(MIN.) = 28.15  
LONGEST FLOWPATH FROM NODE 13870.00 TO NODE 13880.00 = 6706.77 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13875.00 TO NODE 13880.00 IS CODE = 81

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

MAINLINE Tc(MIN.) = 28.15  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 1.774  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 34.90 0.30 0.743 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.743  
SUBAREA AREA(ACRES) = 34.90 SUBAREA RUNOFF(CFS) = 48.73  
EFFECTIVE AREA(ACRES) = 200.33 AREA-AVERAGED Fm(INCH/HR) = 0.27  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.90  
TOTAL AREA(ACRES) = 200.3 PEAK FLOW RATE(CFS) = 271.23

\*\*\*\*\*

FLOW PROCESS FROM NODE 13875.00 TO NODE 13880.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 28.15
RAINFALL INTENSITY(INCH/HR) = 1.77
AREA-AVERAGED Fm(INCH/HR) = 0.27
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.90
EFFECTIVE STREAM AREA(ACRES) = 200.33
TOTAL STREAM AREA(ACRES) = 200.33
PEAK FLOW RATE(CFS) AT CONFLUENCE = 271.23

\*\* CONFLUENCE DATA \*\*

Table with columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 20 rows of data.

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

\*\* PEAK FLOW RATE TABLE \*\*

Table with columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 6 rows of data.

Table with columns: Node number, Q, Tc, Intensity, Fp, Ap, Ae, Headwater Node. Contains 19 rows of data.

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 47565.79 Tc(MIN.) = 117.31
EFFECTIVE AREA(ACRES) = 52545.10 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 68928.9
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13880.00 = 134069.48 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13880.00 TO NODE 13910.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 120.57 DOWNSTREAM(FEET) = 119.70
CHANNEL LENGTH THRU SUBAREA(FEET) = 1190.21 CHANNEL SLOPE = 0.0007
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030
\*ESTIMATED CHANNEL HEIGHT(FEET) = 26.24
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 0.840
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCSSOIL AREA Fp Ap SCSS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 117.69 0.30 0.724 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.724
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 47598.77
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.85
AVERAGE FLOW DEPTH(FEET) = 26.23 TRAVEL TIME(MIN.) = 2.24
Tc(MIN.) = 119.55

SUBAREA AREA(ACRES) = 117.69 SUBAREA RUNOFF(CFS) = 65.97
EFFECTIVE AREA(ACRES) = 52662.79 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 69046.6 PEAK FLOW RATE(CFS) = 47565.79
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030
\*ESTIMATED CHANNEL HEIGHT(FEET) = 26.23

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 26.23 FLOW VELOCITY(FEET/SEC.) = 8.85  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13910.00 = 135259.69 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13880.00 TO NODE 13910.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 119.55  
RAINFALL INTENSITY(INCH/HR) = 0.84  
AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.97  
EFFECTIVE STREAM AREA(ACRES) = 52662.79  
TOTAL STREAM AREA(ACRES) = 69046.58  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 47565.79

\*\*\*\*\*

FLOW PROCESS FROM NODE 13889.00 TO NODE 13890.00 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 447.89  
ELEVATION DATA: UPSTREAM(FEET) = 564.89 DOWNSTREAM(FEET) = 421.92

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 6.976  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 4.496  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS	Tc
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN	(MIN.)
PUBLIC PARK	-	3.03	0.30	0.960	0	6.98

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.960  
SUBAREA RUNOFF(CFS) = 11.48  
TOTAL AREA(ACRES) = 3.03 PEAK FLOW RATE(CFS) = 11.48

\*\*\*\*\*

FLOW PROCESS FROM NODE 13890.00 TO NODE 13891.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 421.92 DOWNSTREAM(FEET) = 392.64  
CHANNEL LENGTH THRU SUBAREA(FEET) = 435.33 CHANNEL SLOPE = 0.0673  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.46  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.985  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	8.12	0.30	0.986	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.986

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 24.99  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.23  
AVERAGE FLOW DEPTH(FEET) = 0.44 TRAVEL TIME(MIN.) = 1.39  
Tc(MIN.) = 8.36  
SUBAREA AREA(ACRES) = 8.12 SUBAREA RUNOFF(CFS) = 26.96  
EFFECTIVE AREA(ACRES) = 11.15 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98  
TOTAL AREA(ACRES) = 11.1 PEAK FLOW RATE(CFS) = 37.04  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.55

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.55 FLOW VELOCITY(FEET/SEC.) = 6.02  
LONGEST FLOWPATH FROM NODE 13889.00 TO NODE 13891.00 = 883.22 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13891.00 TO NODE 13892.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 392.64 DOWNSTREAM(FEET) = 324.46  
CHANNEL LENGTH THRU SUBAREA(FEET) = 662.40 CHANNEL SLOPE = 0.1029  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.64  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.473  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	12.50	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 54.93  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.95  
AVERAGE FLOW DEPTH(FEET) = 0.62 TRAVEL TIME(MIN.) = 1.39  
Tc(MIN.) = 9.75  
SUBAREA AREA(ACRES) = 12.50 SUBAREA RUNOFF(CFS) = 35.70  
EFFECTIVE AREA(ACRES) = 23.65 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 23.6 PEAK FLOW RATE(CFS) = 67.60  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.70

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.70 FLOW VELOCITY(FEET/SEC.) = 8.51  
LONGEST FLOWPATH FROM NODE 13889.00 TO NODE 13892.00 = 1545.62 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13892.00 TO NODE 13893.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 324.46 DOWNSTREAM(FEET) = 240.82  
CHANNEL LENGTH THRU SUBAREA(FEET) = 980.03 CHANNEL SLOPE = 0.0853

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.87  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 3.131  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	15.87	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 87.84  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.75  
 AVERAGE FLOW DEPTH (FEET) = 0.86 TRAVEL TIME (MIN.) = 1.87  
 Tc (MIN.) = 11.62  
 SUBAREA AREA (ACRES) = 15.87 SUBAREA RUNOFF (CFS) = 40.43  
 EFFECTIVE AREA (ACRES) = 39.52 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 39.5 PEAK FLOW RATE (CFS) = 100.75  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.93

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.93 FLOW VELOCITY (FEET/SEC.) = 9.18  
 LONGEST FLOWPATH FROM NODE 13889.00 TO NODE 13893.00 = 2525.65 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13893.00 TO NODE 13894.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 -----

ELEVATION DATA: UPSTREAM (FEET) = 240.82 DOWNSTREAM (FEET) = 163.04  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1144.35 CHANNEL SLOPE = 0.0680  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.18  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.812  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	28.41	0.30	0.985	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.985  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 132.98  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.28  
 AVERAGE FLOW DEPTH (FEET) = 1.16 TRAVEL TIME (MIN.) = 2.06  
 Tc (MIN.) = 13.68  
 SUBAREA AREA (ACRES) = 28.41 SUBAREA RUNOFF (CFS) = 64.35  
 EFFECTIVE AREA (ACRES) = 67.93 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 67.9 PEAK FLOW RATE (CFS) = 153.78  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.26

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.26 FLOW VELOCITY (FEET/SEC.) = 9.73

LONGEST FLOWPATH FROM NODE 13889.00 TO NODE 13894.00 = 3670.00 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13894.00 TO NODE 13910.00 IS CODE = 31  
 -----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<  
 -----

ELEVATION DATA: UPSTREAM (FEET) = 163.04 DOWNSTREAM (FEET) = 119.70  
 FLOW LENGTH (FEET) = 1899.01 MANNING'S N = 0.013  
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 33.0 INCHES  
 PIPE-FLOW VELOCITY (FEET/SEC.) = 17.73  
 ESTIMATED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1  
 PIPE-FLOW (CFS) = 153.78  
 PIPE TRAVEL TIME (MIN.) = 1.79 Tc (MIN.) = 15.46  
 LONGEST FLOWPATH FROM NODE 13889.00 TO NODE 13910.00 = 5569.01 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13894.00 TO NODE 13910.00 IS CODE = 81  
 -----

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

MAINLINE Tc (MIN.) = 15.46  
 \* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 2.568  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	11.69	0.30	0.634	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.634  
 SUBAREA AREA (ACRES) = 11.69 SUBAREA RUNOFF (CFS) = 25.02  
 EFFECTIVE AREA (ACRES) = 79.62 AREA-AVERAGED Fm (INCH/HR) = 0.28  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.94  
 TOTAL AREA (ACRES) = 79.6 PEAK FLOW RATE (CFS) = 163.86

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13894.00 TO NODE 13910.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<  
 -----

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION (MIN.) = 15.46  
 RAINFALL INTENSITY (INCH/HR) = 2.57  
 AREA-AVERAGED Fm (INCH/HR) = 0.28  
 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.94  
 EFFECTIVE STREAM AREA (ACRES) = 79.62  
 TOTAL STREAM AREA (ACRES) = 79.62  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 163.86

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	27522.44	26.39	1.842	0.30 ( 0.29)	0.95	5839.2	13810.00
1	27912.91	27.62	1.794	0.30 ( 0.29)	0.96	6165.8	13850.00
1	28882.42	30.71	1.685	0.30 ( 0.29)	0.96	6969.8	13870.00

1	30819.51	37.07	1.520	0.30 ( 0.29)	0.96	8577.3	10400.00
1	31304.50	38.47	1.484	0.30 ( 0.29)	0.96	9115.2	13830.00
1	32899.76	43.35	1.390	0.30 ( 0.29)	0.96	10908.2	20700.00
1	35337.56	51.48	1.265	0.30 ( 0.29)	0.97	14208.8	10100.00
1	37622.66	58.33	1.189	0.30 ( 0.29)	0.97	17586.4	20300.00
1	40478.90	70.42	1.100	0.30 ( 0.29)	0.96	24275.1	31400.00
1	42025.95	80.36	1.033	0.30 ( 0.29)	0.96	29519.9	13100.00
1	42635.33	87.37	0.986	0.30 ( 0.29)	0.96	32643.2	11801.00
1	43915.02	97.93	0.934	0.30 ( 0.29)	0.96	38056.4	11530.00
1	44703.27	102.16	0.915	0.30 ( 0.29)	0.96	40702.9	11701.00
1	46285.28	110.53	0.879	0.30 ( 0.29)	0.97	46426.6	13500.00
1	47183.82	115.38	0.858	0.30 ( 0.29)	0.97	49720.1	10800.00
1	47565.79	119.55	0.840	0.30 ( 0.29)	0.97	52662.8	11130.00
1	46951.99	129.20	0.819	0.30 ( 0.29)	0.97	57701.5	12410.00
1	46180.82	137.58	0.801	0.30 ( 0.29)	0.97	61443.7	11201.00
1	45665.16	142.61	0.791	0.30 ( 0.29)	0.97	63173.4	12201.00
1	44545.96	149.79	0.776	0.30 ( 0.29)	0.97	65028.7	12231.00
1	43142.37	157.80	0.759	0.30 ( 0.29)	0.97	66665.1	10400.00
1	41687.26	165.94	0.742	0.30 ( 0.29)	0.97	67959.7	12010.00
1	40432.32	172.09	0.729	0.30 ( 0.29)	0.97	68308.4	10210.00
1	35950.26	201.00	0.691	0.30 ( 0.29)	0.98	69046.6	10100.00
2	163.86	15.46	2.568	0.30 ( 0.28)	0.94	79.6	13889.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23819.67	15.46	2.568	0.30 ( 0.29)	0.95	3500.7	13889.00
2	27634.24	26.39	1.842	0.30 ( 0.29)	0.95	5918.8	13810.00
3	28021.33	27.62	1.794	0.30 ( 0.29)	0.96	6245.4	13850.00
4	28982.97	30.71	1.685	0.30 ( 0.29)	0.96	7049.4	13870.00
5	30908.27	37.07	1.520	0.30 ( 0.29)	0.96	8656.9	10400.00
6	31390.65	38.47	1.484	0.30 ( 0.29)	0.96	9194.8	13830.00
7	32979.19	43.35	1.390	0.30 ( 0.29)	0.96	10987.8	20700.00
8	35408.08	51.48	1.265	0.30 ( 0.29)	0.97	14288.4	10100.00
9	37687.68	58.33	1.189	0.30 ( 0.29)	0.97	17666.0	20300.00
10	40537.55	70.42	1.100	0.30 ( 0.29)	0.96	24354.7	31400.00
11	42079.81	80.36	1.033	0.30 ( 0.29)	0.96	29599.6	13100.00
12	42685.80	87.37	0.986	0.30 ( 0.29)	0.96	32722.8	11801.00
13	43961.77	97.93	0.934	0.30 ( 0.29)	0.96	38136.0	11530.00
14	44748.70	102.16	0.915	0.30 ( 0.29)	0.96	40782.5	11701.00
15	46328.11	110.53	0.879	0.30 ( 0.29)	0.97	46506.2	13500.00
16	47225.14	115.38	0.858	0.30 ( 0.29)	0.97	49799.7	10800.00
17	47605.82	119.55	0.840	0.30 ( 0.29)	0.97	52742.4	11130.00
18	46990.50	129.20	0.819	0.30 ( 0.29)	0.97	57781.2	12410.00
19	46218.08	137.58	0.801	0.30 ( 0.29)	0.97	61523.3	11201.00
20	45701.68	142.61	0.791	0.30 ( 0.29)	0.97	63253.0	12201.00
21	44581.41	149.79	0.776	0.30 ( 0.29)	0.97	65108.4	12231.00
22	43176.61	157.80	0.759	0.30 ( 0.29)	0.97	66744.8	10400.00
23	41720.29	165.94	0.742	0.30 ( 0.29)	0.97	68039.3	12010.00
24	40464.44	172.09	0.729	0.30 ( 0.29)	0.97	68388.0	10210.00
25	35979.60	201.00	0.691	0.30 ( 0.29)	0.98	69126.2	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 47605.82 Tc(MIN.) = 119.55  
EFFECTIVE AREA(ACRES) = 52742.41 AREA-AVERAGED Fm(INCH/HR) = 0.29

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA(ACRES) = 69126.2  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13910.00 = 135259.69 FEET.

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 69126.2 TC(MIN.) = 119.55  
EFFECTIVE AREA(ACRES) = 52742.41 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.971  
PEAK FLOW RATE(CFS) = 47605.82

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23819.67	15.46	2.568	0.30 ( 0.29)	0.95	3500.7	13889.00
2	27634.24	26.39	1.842	0.30 ( 0.29)	0.95	5918.8	13810.00
3	28021.33	27.62	1.794	0.30 ( 0.29)	0.96	6245.4	13850.00
4	28982.97	30.71	1.685	0.30 ( 0.29)	0.96	7049.4	13870.00
5	30908.27	37.07	1.520	0.30 ( 0.29)	0.96	8656.9	10400.00
6	31390.65	38.47	1.484	0.30 ( 0.29)	0.96	9194.8	13830.00
7	32979.19	43.35	1.390	0.30 ( 0.29)	0.96	10987.8	20700.00
8	35408.08	51.48	1.265	0.30 ( 0.29)	0.97	14288.4	10100.00
9	37687.68	58.33	1.189	0.30 ( 0.29)	0.97	17666.0	20300.00
10	40537.55	70.42	1.100	0.30 ( 0.29)	0.96	24354.7	31400.00
11	42079.81	80.36	1.033	0.30 ( 0.29)	0.96	29599.6	13100.00
12	42685.80	87.37	0.986	0.30 ( 0.29)	0.96	32722.8	11801.00
13	43961.77	97.93	0.934	0.30 ( 0.29)	0.96	38136.0	11530.00
14	44748.70	102.16	0.915	0.30 ( 0.29)	0.96	40782.5	11701.00
15	46328.11	110.53	0.879	0.30 ( 0.29)	0.97	46506.2	13500.00
16	47225.14	115.38	0.858	0.30 ( 0.29)	0.97	49799.7	10800.00
17	47605.82	119.55	0.840	0.30 ( 0.29)	0.97	52742.4	11130.00
18	46990.50	129.20	0.819	0.30 ( 0.29)	0.97	57781.2	12410.00
19	46218.08	137.58	0.801	0.30 ( 0.29)	0.97	61523.3	11201.00
20	45701.68	142.61	0.791	0.30 ( 0.29)	0.97	63253.0	12201.00
21	44581.41	149.79	0.776	0.30 ( 0.29)	0.97	65108.4	12231.00
22	43176.61	157.80	0.759	0.30 ( 0.29)	0.97	66744.8	10400.00
23	41720.29	165.94	0.742	0.30 ( 0.29)	0.97	68039.3	12010.00
24	40464.44	172.09	0.729	0.30 ( 0.29)	0.97	68388.0	10210.00
25	35979.60	201.00	0.691	0.30 ( 0.29)	0.98	69126.2	10100.00

=====  
END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2013 Advanced Engineering Software (aes)  
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Analysis prepared by:

-----  
FILE NAME: S39.DAT  
TIME/DATE OF STUDY: 10:47 09/12/2017  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 50.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.220
- 2) 10.00; 3.380
- 3) 15.00; 2.606
- 4) 20.00; 2.183
- 5) 25.00; 1.894
- 6) 30.00; 1.703
- 7) 40.00; 1.444
- 8) 50.00; 1.282
- 9) 60.00; 1.169
- 10) 90.00; 0.968
- 11) 120.00; 0.837
- 12) 180.00; 0.712
- 13) 360.00; 0.522
- 14) 1200.00; 0.227

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13900.00 TO NODE 13901.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 600.65  
ELEVATION DATA: UPSTREAM(FEET) = 442.40 DOWNSTREAM(FEET) = 385.16

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.859  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 3.247  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)  
AGRICULTURAL POOR COVER  
"FALLOW" - 4.00 0.30 1.000 0 10.86  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 10.61  
TOTAL AREA(ACRES) = 4.00 PEAK FLOW RATE(CFS) = 10.61

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13901.00 TO NODE 13902.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 385.16 DOWNSTREAM(FEET) = 288.21  
CHANNEL LENGTH THRU SUBAREA(FEET) = 647.42 CHANNEL SLOPE = 0.1497  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.32  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.983  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN  
USER-DEFINED - 8.47 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.86  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.34  
AVERAGE FLOW DEPTH(FEET) = 0.31 TRAVEL TIME(MIN.) = 1.70  
Tc(MIN.) = 12.56  
SUBAREA AREA(ACRES) = 8.47 SUBAREA RUNOFF(CFS) = 20.46  
EFFECTIVE AREA(ACRES) = 12.47 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 12.5 PEAK FLOW RATE(CFS) = 30.12  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.39

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.39 FLOW VELOCITY(FEET/SEC.) = 7.24  
LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13902.00 = 1248.07 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13902.00 TO NODE 13903.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 288.21 DOWNSTREAM(FEET) = 184.89  
CHANNEL LENGTH THRU SUBAREA(FEET) = 669.27 CHANNEL SLOPE = 0.1544  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.57  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.795  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 23.85 0.30 0.982 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.982  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 56.98  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.15  
AVERAGE FLOW DEPTH(FEET) = 0.56 TRAVEL TIME(MIN.) = 1.22  
Tc(MIN.) = 13.78  
SUBAREA AREA(ACRES) = 23.85 SUBAREA RUNOFF(CFS) = 53.67  
EFFECTIVE AREA(ACRES) = 36.32 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 36.3 PEAK FLOW RATE(CFS) = 81.67  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.69

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.69 FLOW VELOCITY(FEET/SEC.) = 10.38  
LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13903.00 = 1917.34 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13903.00 TO NODE 13904.00 IS CODE = 31  
-----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 184.89 DOWNSTREAM(FEET) = 155.08  
FLOW LENGTH(FEET) = 876.66 MANNING'S N = 0.013  
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000  
DEPTH OF FLOW IN 36.0 INCH PIPE IS 22.2 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 17.86  
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 81.67  
PIPE TRAVEL TIME(MIN.) = 0.82 Tc(MIN.) = 14.60  
LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13904.00 = 2794.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13903.00 TO NODE 13904.00 IS CODE = 81  
-----

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

-----  
MAINLINE Tc(MIN.) = 14.60  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.668  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

USER-DEFINED - 21.29 0.30 0.996 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.996  
SUBAREA AREA(ACRES) = 21.29 SUBAREA RUNOFF(CFS) = 45.40  
EFFECTIVE AREA(ACRES) = 57.61 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 57.6 PEAK FLOW RATE(CFS) = 122.93

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13904.00 TO NODE 13920.00 IS CODE = 31  
-----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 155.08 DOWNSTREAM(FEET) = 118.00  
FLOW LENGTH(FEET) = 1961.38 MANNING'S N = 0.013  
DEPTH OF FLOW IN 42.0 INCH PIPE IS 32.3 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 15.50  
ESTIMATED PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 122.93  
PIPE TRAVEL TIME(MIN.) = 2.11 Tc(MIN.) = 16.71  
LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13920.00 = 4755.38 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13904.00 TO NODE 13920.00 IS CODE = 81  
-----

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

-----  
MAINLINE Tc(MIN.) = 16.71  
\* 50 YEAR RAINFALL INTENSITY(INCH/HR) = 2.462  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 43.53 0.30 0.649 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.649  
SUBAREA AREA(ACRES) = 43.53 SUBAREA RUNOFF(CFS) = 88.81  
EFFECTIVE AREA(ACRES) = 101.14 AREA-AVERAGED Fm(INCH/HR) = 0.25  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.84  
TOTAL AREA(ACRES) = 101.1 PEAK FLOW RATE(CFS) = 201.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13904.00 TO NODE 13920.00 IS CODE = 10  
-----

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

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13910.00 TO NODE 13910.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<

-----  
PEAK FLOWRATE TABLE FILE NAME: S38.DNA  
MEMORY BANK # 2 DEFINED AS FOLLOWS:  
STREAM Q Tc Fp(Fm) Ap Ae HEADWATER  
NUMBER (CFS) (MIN.) (INCH/HR) (ACRES) NODE  
1 23819.67 15.46 0.30( 0.29) 0.95 3500.7 13889.00  
2 28982.97 30.71 0.30( 0.29) 0.96 7049.4 13870.00



3	31390.65	38.47	0.30	( 0.29)	0.96	9194.8	13830.00
4	32979.19	43.35	0.30	( 0.29)	0.96	10987.8	20700.00
5	35408.08	51.48	0.30	( 0.29)	0.97	14288.4	10100.00
6	37687.68	58.33	0.30	( 0.29)	0.97	17666.0	20300.00
7	40537.55	70.42	0.30	( 0.29)	0.96	24354.7	31400.00
8	42079.81	80.36	0.30	( 0.29)	0.96	29599.6	13100.00
9	42685.80	87.37	0.30	( 0.29)	0.96	32722.8	11801.00
10	44748.70	102.16	0.30	( 0.29)	0.96	40782.5	11701.00
11	46328.11	110.53	0.30	( 0.29)	0.97	46506.2	13500.00
12	47605.82	119.55	0.30	( 0.29)	0.97	52742.4	11130.00
13	46990.50	129.20	0.30	( 0.29)	0.97	57781.2	12410.00
14	46218.08	137.58	0.30	( 0.29)	0.97	61523.3	11201.00
15	45701.68	142.61	0.30	( 0.29)	0.97	63253.0	12201.00
16	44581.41	149.79	0.30	( 0.29)	0.97	65108.4	12231.00
17	43176.61	157.80	0.30	( 0.29)	0.97	66744.8	10400.00
18	41720.29	165.94	0.30	( 0.29)	0.97	68039.3	12010.00
19	40464.44	172.09	0.30	( 0.29)	0.97	68388.0	10210.00
20	35979.60	201.00	0.30	( 0.29)	0.98	69126.2	10100.00

TOTAL AREA (ACRES) = 69126.2

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13910.00 TO NODE 13910.00 IS CODE = 14.0

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23819.67	15.46	0.30 ( 0.29)	0.95	3500.7	13889.00
2	28982.97	30.71	0.30 ( 0.29)	0.96	7049.4	13870.00
3	31390.65	38.47	0.30 ( 0.29)	0.96	9194.8	13830.00
4	32979.19	43.35	0.30 ( 0.29)	0.96	10987.8	20700.00
5	35408.08	51.48	0.30 ( 0.29)	0.97	14288.4	10100.00
6	37687.68	58.33	0.30 ( 0.29)	0.97	17666.0	20300.00
7	40537.55	70.42	0.30 ( 0.29)	0.96	24354.7	31400.00
8	42079.81	80.36	0.30 ( 0.29)	0.96	29599.6	13100.00
9	42685.80	87.37	0.30 ( 0.29)	0.96	32722.8	11801.00
10	44748.70	102.16	0.30 ( 0.29)	0.96	40782.5	11701.00
11	46328.11	110.53	0.30 ( 0.29)	0.97	46506.2	13500.00
12	47605.82	119.55	0.30 ( 0.29)	0.97	52742.4	11130.00
13	46990.50	129.20	0.30 ( 0.29)	0.97	57781.2	12410.00
14	46218.08	137.58	0.30 ( 0.29)	0.97	61523.3	11201.00
15	45701.68	142.61	0.30 ( 0.29)	0.97	63253.0	12201.00
16	44581.41	149.79	0.30 ( 0.29)	0.97	65108.4	12231.00
17	43176.61	157.80	0.30 ( 0.29)	0.97	66744.8	10400.00
18	41720.29	165.94	0.30 ( 0.29)	0.97	68039.3	12010.00
19	40464.44	172.09	0.30 ( 0.29)	0.97	68388.0	10210.00
20	35979.60	201.00	0.30 ( 0.29)	0.98	69126.2	10100.00

TOTAL AREA (ACRES) = 69126.2

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13910.00 TO NODE 13920.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<<

ELEVATION DATA: UPSTREAM( FEET) = 119.70 DOWNSTREAM( FEET) = 118.00

CHANNEL LENGTH THRU SUBAREA( FEET) = 1376.26 CHANNEL SLOPE = 0.0012  
GIVEN CHANNEL BASE( FEET) = 100.00 CHANNEL FREEBOARD( FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT( FEET) = 23.09  
\* 50 YEAR RAINFALL INTENSITY( INCH/HR) = 0.833  
SUBAREA LOSS RATE DATA( AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	96.09	0.30	0.535	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp( INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.535  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW( CFS) = 47634.92  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 10.73  
AVERAGE FLOW DEPTH( FEET) = 23.09 TRAVEL TIME( MIN.) = 2.14  
Tc( MIN.) = 121.68  
SUBAREA AREA( ACRES) = 96.09 SUBAREA RUNOFF( CFS) = 58.20  
EFFECTIVE AREA( ACRES) = 52838.50 AREA-AVERAGED Fm( INCH/HR) = 0.29  
AREA-AVERAGED Fp( INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA( ACRES) = 69222.3 PEAK FLOW RATE( CFS) = 47605.82  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE( FEET) = 100.00 CHANNEL FREEBOARD( FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT( FEET) = 23.08

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH( FEET) = 23.08 FLOW VELOCITY( FEET/SEC.) = 10.72

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13920.00 = 136635.95 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13904.00 TO NODE 13920.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23819.67	18.05	2.348	0.30 ( 0.28)	0.94	3596.8	13889.00
2	28982.97	33.16	1.621	0.30 ( 0.29)	0.95	7145.5	13870.00
3	31390.65	40.86	1.430	0.30 ( 0.29)	0.96	9290.9	13830.00
4	32979.19	45.71	1.351	0.30 ( 0.29)	0.96	11083.9	20700.00
5	35408.08	53.80	1.239	0.30 ( 0.29)	0.96	14384.5	10100.00
6	37687.68	60.61	1.165	0.30 ( 0.29)	0.96	17762.1	20300.00
7	40537.55	72.66	1.084	0.30 ( 0.29)	0.96	24450.8	31400.00
8	42079.81	82.57	1.018	0.30 ( 0.29)	0.96	29695.6	13100.00
9	42685.80	89.58	0.971	0.30 ( 0.29)	0.96	32818.9	11801.00
10	44748.70	104.33	0.905	0.30 ( 0.29)	0.96	40878.6	11701.00
11	46328.11	112.68	0.869	0.30 ( 0.29)	0.97	46602.3	13500.00
12	47605.82	121.68	0.833	0.30 ( 0.29)	0.97	52838.5	11130.00
13	46990.50	131.34	0.813	0.30 ( 0.29)	0.97	57877.2	12410.00
14	46218.08	139.73	0.796	0.30 ( 0.29)	0.97	61619.4	11201.00
15	45701.68	144.77	0.785	0.30 ( 0.29)	0.97	63349.1	12201.00
16	44581.41	151.97	0.770	0.30 ( 0.29)	0.97	65204.5	12231.00
17	43176.61	159.99	0.754	0.30 ( 0.29)	0.97	66840.9	10400.00
18	41720.29	168.15	0.737	0.30 ( 0.29)	0.97	68135.4	12010.00
19	40464.44	174.33	0.724	0.30 ( 0.29)	0.97	68484.1	10210.00
20	35979.60	203.31	0.687	0.30 ( 0.29)	0.97	69222.3	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13920.00 = 136635.95 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	201.03	16.71	2.462	0.30 ( 0.25)	0.84	101.1	13900.00

LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13920.00 = 4755.38 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23462.29	16.71	2.462	0.30 ( 0.28)	0.94	3430.8	13900.00
2	24010.38	18.05	2.348	0.30 ( 0.28)	0.94	3697.9	13889.00
3	29107.50	33.16	1.621	0.30 ( 0.28)	0.95	7246.6	13870.00
4	31497.78	40.86	1.430	0.30 ( 0.29)	0.96	9392.0	13830.00
5	33079.17	45.71	1.351	0.30 ( 0.29)	0.96	11185.0	20700.00
6	35497.83	53.80	1.239	0.30 ( 0.29)	0.96	14485.6	10100.00
7	37770.68	60.61	1.165	0.30 ( 0.29)	0.96	17863.3	20300.00
8	40613.21	72.66	1.084	0.30 ( 0.29)	0.96	24552.0	31400.00
9	42149.41	82.57	1.018	0.30 ( 0.29)	0.96	29796.8	13100.00
10	42751.14	89.58	0.971	0.30 ( 0.29)	0.96	32920.1	11801.00
11	44808.07	104.33	0.905	0.30 ( 0.29)	0.96	40979.7	11701.00
12	46384.17	112.68	0.869	0.30 ( 0.29)	0.97	46703.4	13500.00
13	47658.65	121.68	0.833	0.30 ( 0.29)	0.97	52939.6	11130.00
14	47041.50	131.34	0.813	0.30 ( 0.29)	0.97	57978.4	12410.00
15	46267.49	139.73	0.796	0.30 ( 0.29)	0.97	61720.5	11201.00
16	45750.13	144.77	0.785	0.30 ( 0.29)	0.97	63450.2	12201.00
17	44628.49	151.97	0.770	0.30 ( 0.29)	0.97	65305.6	12231.00
18	43222.18	159.99	0.754	0.30 ( 0.29)	0.97	66942.0	10400.00
19	41764.31	168.15	0.737	0.30 ( 0.29)	0.97	68236.5	12010.00
20	40507.29	174.33	0.724	0.30 ( 0.29)	0.97	68585.2	10210.00
21	36019.13	203.31	0.687	0.30 ( 0.29)	0.97	69323.4	10100.00

TOTAL AREA (ACRES) = 69323.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 47658.65 Tc (MIN.) = 121.685  
EFFECTIVE AREA (ACRES) = 52939.64 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA (ACRES) = 69323.4  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13920.00 = 136635.95 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13920.00 TO NODE 13921.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 118.00 DOWNSTREAM (FEET) = 115.28  
CHANNEL LENGTH THRU SUBAREA (FEET) = 335.44 CHANNEL SLOPE = 0.0081  
GIVEN CHANNEL BASE (FEET) = 100.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 14.33  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 0.833  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	134.30	0.30	0.658	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.658

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 47697.06  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 21.16  
AVERAGE FLOW DEPTH (FEET) = 14.33 TRAVEL TIME (MIN.) = 0.26  
Tc (MIN.) = 121.95  
SUBAREA AREA (ACRES) = 134.30 SUBAREA RUNOFF (CFS) = 76.82  
EFFECTIVE AREA (ACRES) = 53073.94 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA (ACRES) = 69457.7 PEAK FLOW RATE (CFS) = 47658.65  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE (FEET) = 100.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 14.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 14.32 FLOW VELOCITY (FEET/SEC.) = 21.15  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13921.00 = 136971.39 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13921.00 TO NODE 14010.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 115.28 DOWNSTREAM (FEET) = 100.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1396.08 CHANNEL SLOPE = 0.0109  
GIVEN CHANNEL BASE (FEET) = 100.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 13.24  
\* 50 YEAR RAINFALL INTENSITY (INCH/HR) = 0.831

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	96.27	0.30	0.723	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.723  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 47685.25  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 23.54  
AVERAGE FLOW DEPTH (FEET) = 13.24 TRAVEL TIME (MIN.) = 0.99  
Tc (MIN.) = 122.94

SUBAREA AREA (ACRES) = 96.27 SUBAREA RUNOFF (CFS) = 53.20  
EFFECTIVE AREA (ACRES) = 53170.21 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA (ACRES) = 69554.0 PEAK FLOW RATE (CFS) = 47658.65  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE (FEET) = 100.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 13.24

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 13.24 FLOW VELOCITY (FEET/SEC.) = 23.53  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 14010.00 = 138367.47 FEET.

-----  
END OF STUDY SUMMARY:  
TOTAL AREA (ACRES) = 69554.0 TC (MIN.) = 122.94  
EFFECTIVE AREA (ACRES) = 53170.21 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.969  
PEAK FLOW RATE (CFS) = 47658.65

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23462.29	18.25	2.331	0.30 ( 0.28)	0.92	3661.3	13900.00
2	24010.38	19.58	2.218	0.30 ( 0.28)	0.93	3928.5	13889.00
3	29107.50	34.61	1.584	0.30 ( 0.28)	0.94	7477.2	13870.00
4	31497.78	42.28	1.407	0.30 ( 0.28)	0.95	9622.6	13830.00
5	33079.17	47.11	1.329	0.30 ( 0.29)	0.95	11415.6	20700.00
6	35497.83	55.17	1.224	0.30 ( 0.29)	0.96	14716.2	10100.00
7	37770.68	61.95	1.156	0.30 ( 0.29)	0.96	18093.8	20300.00
8	40613.21	73.97	1.075	0.30 ( 0.29)	0.96	24782.5	31400.00
9	42149.41	83.87	1.009	0.30 ( 0.29)	0.96	30027.4	13100.00
10	42751.14	90.87	0.964	0.30 ( 0.29)	0.96	33150.6	11801.00
11	44808.07	105.61	0.900	0.30 ( 0.29)	0.96	41210.3	11701.00
12	46384.17	113.95	0.863	0.30 ( 0.29)	0.96	46934.0	13500.00
13	47658.65	122.94	0.831	0.30 ( 0.29)	0.97	53170.2	11130.00
14	47041.50	132.60	0.811	0.30 ( 0.29)	0.97	58209.0	12410.00
15	46267.49	141.00	0.793	0.30 ( 0.29)	0.97	61951.1	11201.00
16	45750.13	146.03	0.783	0.30 ( 0.29)	0.97	63680.8	12201.00
17	44628.49	153.25	0.768	0.30 ( 0.29)	0.97	65536.2	12231.00
18	43222.18	161.28	0.751	0.30 ( 0.29)	0.97	67172.6	10400.00
19	41764.31	169.45	0.734	0.30 ( 0.29)	0.97	68467.1	12010.00
20	40507.29	175.64	0.721	0.30 ( 0.29)	0.97	68815.8	10210.00
21	36019.13	204.67	0.686	0.30 ( 0.29)	0.97	69554.0	10100.00

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END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

FILE NAME: S1.DAT
TIME/DATE OF STUDY: 09:56 04/01/2013

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 7.441
2) 10.00; 4.561
3) 15.00; 3.432
4) 20.00; 2.736
5) 25.00; 2.323
6) 30.00; 2.065
7) 40.00; 1.806
8) 50.00; 1.530
9) 60.00; 1.495
10) 90.00; 1.304
11) 120.00; 1.173
12) 180.00; 1.010
13) 360.00; 0.787
14) 1440.00; 0.357

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*
Table with columns: NO., WIDTH (FT), CROSSFALL (FT), IN- / SIDE, OUT- / SIDE/ WAY, HEIGHT (FT), CURB GUTTER-GEOMETRIES (WIDTH, LIP, HIKE), MANNING FACTOR (n)

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 10100.00 TO NODE 10101.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 934.06
ELEVATION DATA: UPSTREAM(FEET) = 3351.52 DOWNSTREAM(FEET) = 3172.56

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 15.152
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.411
SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ LAND USE SCS SOIL AREA Fp Ap SCS Tc
GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" - 3.55 0.30 1.000 0 15.15
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 9.94
TOTAL AREA (ACRES) = 3.55 PEAK FLOW RATE (CFS) = 9.94

\*\*\*\*\*

FLOW PROCESS FROM NODE 10101.00 TO NODE 10102.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3172.56 DOWNSTREAM(FEET) = 3090.55
CHANNEL LENGTH THRU SUBAREA(FEET) = 942.40 CHANNEL SLOPE = 0.0870
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.65
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.960
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ LAND USE SCS SOIL AREA Fp Ap SCS
GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 19.22 0.30 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 33.07
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.85
AVERAGE FLOW DEPTH(FEET) = 0.61 TRAVEL TIME(MIN.) = 3.24
Tc(MIN.) = 18.39
SUBAREA AREA(ACRES) = 19.22 SUBAREA RUNOFF(CFS) = 46.02
EFFECTIVE AREA(ACRES) = 22.77 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 22.8 PEAK FLOW RATE(CFS) = 54.52
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.82

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.82 FLOW VELOCITY(FEET/SEC.) = 5.72
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10102.00 = 1876.46 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10102.00 TO NODE 10103.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 3090.55 DOWNSTREAM(FEET) = 3022.44  
CHANNEL LENGTH THRU SUBAREA(FEET) = 920.65 CHANNEL SLOPE = 0.0740  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.07

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.662

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	21.52	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 77.41

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.11

AVERAGE FLOW DEPTH(FEET) = 1.05 TRAVEL TIME(MIN.) = 2.51

Tc(MIN.) = 20.90

SUBAREA AREA(ACRES) = 21.52 SUBAREA RUNOFF(CFS) = 45.74

EFFECTIVE AREA(ACRES) = 44.29 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 44.3 PEAK FLOW RATE(CFS) = 94.14

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.17

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.17 FLOW VELOCITY(FEET/SEC.) = 6.51

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10103.00 = 2797.11 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10103.00 TO NODE 10104.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 3022.44 DOWNSTREAM(FEET) = 2962.57  
CHANNEL LENGTH THRU SUBAREA(FEET) = 977.87 CHANNEL SLOPE = 0.0612  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.03

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.492

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	126.78	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 219.28

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.93

AVERAGE FLOW DEPTH(FEET) = 1.98 TRAVEL TIME(MIN.) = 2.06

Tc(MIN.) = 22.96

SUBAREA AREA(ACRES) = 126.78 SUBAREA RUNOFF(CFS) = 250.09

EFFECTIVE AREA(ACRES) = 171.07 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 171.1 PEAK FLOW RATE(CFS) = 337.46

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.51

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.51 FLOW VELOCITY(FEET/SEC.) = 8.97

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10104.00 = 3774.98 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10104.00 TO NODE 10105.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2962.57 DOWNSTREAM(FEET) = 2917.85  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1864.94 CHANNEL SLOPE = 0.0240  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.71

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.195

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	112.68	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 433.66

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.87

AVERAGE FLOW DEPTH(FEET) = 3.65 TRAVEL TIME(MIN.) = 4.53

Tc(MIN.) = 27.48

SUBAREA AREA(ACRES) = 112.68 SUBAREA RUNOFF(CFS) = 192.17

EFFECTIVE AREA(ACRES) = 283.75 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 283.8 PEAK FLOW RATE(CFS) = 483.93

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.86

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.86 FLOW VELOCITY(FEET/SEC.) = 7.08

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10105.00 = 5639.92 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10105.00 TO NODE 10105.50 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2917.85 DOWNSTREAM(FEET) = 2880.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1406.97 CHANNEL SLOPE = 0.0269  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.32

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.054

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	183.39	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 628.68  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.92  
AVERAGE FLOW DEPTH(FEET) = 4.28 TRAVEL TIME(MIN.) = 2.96  
Tc(MIN.) = 30.44  
SUBAREA AREA(ACRES) = 183.39 SUBAREA RUNOFF(CFS) = 289.44  
EFFECTIVE AREA(ACRES) = 467.14 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 467.1 PEAK FLOW RATE(CFS) = 737.26  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.63

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 4.63 FLOW VELOCITY(FEET/SEC.) = 8.27  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10105.50 = 7046.89 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10105.50 TO NODE 10106.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2880.00 DOWNSTREAM(FEET) = 2868.10  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1701.11 CHANNEL SLOPE = 0.0070  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.61  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.910

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 60.63 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 781.19  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.11  
AVERAGE FLOW DEPTH(FEET) = 6.59 TRAVEL TIME(MIN.) = 5.55  
Tc(MIN.) = 35.99  
SUBAREA AREA(ACRES) = 60.63 SUBAREA RUNOFF(CFS) = 87.85  
EFFECTIVE AREA(ACRES) = 527.77 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 527.8 PEAK FLOW RATE(CFS) = 764.67  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.53

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 6.53 FLOW VELOCITY(FEET/SEC.) = 5.08  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10106.00 = 8748.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10106.00 TO NODE 10107.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2868.10 DOWNSTREAM(FEET) = 2781.28  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2951.00 CHANNEL SLOPE = 0.0294  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.87  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.763

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 123.11 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 845.77  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.86  
AVERAGE FLOW DEPTH(FEET) = 4.85 TRAVEL TIME(MIN.) = 5.55  
Tc(MIN.) = 41.54  
SUBAREA AREA(ACRES) = 123.11 SUBAREA RUNOFF(CFS) = 162.15  
EFFECTIVE AREA(ACRES) = 650.88 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 650.9 PEAK FLOW RATE(CFS) = 857.27  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.88

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 4.88 FLOW VELOCITY(FEET/SEC.) = 8.90  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10107.00 = 11699.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10107.00 TO NODE 10108.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2781.28 DOWNSTREAM(FEET) = 2725.20  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2630.56 CHANNEL SLOPE = 0.0213  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.63  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.615

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 186.62 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 967.75  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.16  
AVERAGE FLOW DEPTH(FEET) = 5.60 TRAVEL TIME(MIN.) = 5.37  
Tc(MIN.) = 46.92  
SUBAREA AREA(ACRES) = 186.62 SUBAREA RUNOFF(CFS) = 220.88  
EFFECTIVE AREA(ACRES) = 837.50 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 837.5 PEAK FLOW RATE(CFS) = 991.27  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.66

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 5.66 FLOW VELOCITY(FEET/SEC.) = 8.21  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10108.00 = 14329.56 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10108.00 TO NODE 10109.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2725.20 DOWNSTREAM(FEET) = 2581.72  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2890.52 CHANNEL SLOPE = 0.0496  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.76

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.526

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	112.07	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1053.10

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.38

AVERAGE FLOW DEPTH(FEET) = 4.75 TRAVEL TIME(MIN.) = 4.24

Tc(MIN.) = 51.15

SUBAREA AREA(ACRES) = 112.07 SUBAREA RUNOFF(CFS) = 123.66

EFFECTIVE AREA(ACRES) = 949.57 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 949.6 PEAK FLOW RATE(CFS) = 1047.78

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.73

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 4.73 FLOW VELOCITY(FEET/SEC.) = 11.37

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10109.00 = 17220.08 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10109.00 TO NODE 10110.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2581.72 DOWNSTREAM(FEET) = 2367.59  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2877.15 CHANNEL SLOPE = 0.0744  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.44

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.513

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	145.21	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1127.08

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.46

AVERAGE FLOW DEPTH(FEET) = 4.44 TRAVEL TIME(MIN.) = 3.56

Tc(MIN.) = 54.72

SUBAREA AREA(ACRES) = 145.21 SUBAREA RUNOFF(CFS) = 158.60

EFFECTIVE AREA(ACRES) = 1094.78 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1094.8 PEAK FLOW RATE(CFS) = 1195.72

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.57

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 4.57 FLOW VELOCITY(FEET/SEC.) = 13.66

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10110.00 = 20097.23 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10110.00 TO NODE 10111.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2367.59 DOWNSTREAM(FEET) = 2075.82  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2802.04 CHANNEL SLOPE = 0.1041  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.52

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.503

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	339.01	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1379.30

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.06

AVERAGE FLOW DEPTH(FEET) = 4.51 TRAVEL TIME(MIN.) = 2.91

Tc(MIN.) = 57.63

SUBAREA AREA(ACRES) = 339.01 SUBAREA RUNOFF(CFS) = 367.16

EFFECTIVE AREA(ACRES) = 1433.79 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1433.8 PEAK FLOW RATE(CFS) = 1552.86

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.79

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 4.79 FLOW VELOCITY(FEET/SEC.) = 16.57

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10111.00 = 22899.27 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10111.00 TO NODE 10112.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2075.82 DOWNSTREAM(FEET) = 2004.03  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3782.59 CHANNEL SLOPE = 0.0190  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 7.50  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.466  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	265.32	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1692.04  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.03  
 AVERAGE FLOW DEPTH (FEET) = 7.50 TRAVEL TIME (MIN.) = 6.98  
 Tc (MIN.) = 64.61  
 SUBAREA AREA (ACRES) = 265.32 SUBAREA RUNOFF (CFS) = 278.36  
 EFFECTIVE AREA (ACRES) = 1699.11 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 1699.1 PEAK FLOW RATE (CFS) = 1782.65  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 7.68

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 7.68 FLOW VELOCITY (FEET/SEC.) = 9.15  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10112.00 = 26681.86 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10112.00 TO NODE 10112.50 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 2004.03 DOWNSTREAM (FEET) = 1982.04  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1479.53 CHANNEL SLOPE = 0.0149  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 8.46  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.447  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	307.63	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1941.48  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.54  
 AVERAGE FLOW DEPTH (FEET) = 8.45 TRAVEL TIME (MIN.) = 2.89  
 Tc (MIN.) = 67.49  
 SUBAREA AREA (ACRES) = 307.63 SUBAREA RUNOFF (CFS) = 317.67  
 EFFECTIVE AREA (ACRES) = 2006.74 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 2006.7 PEAK FLOW RATE (CFS) = 2072.21  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 8.71

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 8.71 FLOW VELOCITY (FEET/SEC.) = 8.68  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10112.50 = 28161.39 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10112.50 TO NODE 10222.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 1982.04 DOWNSTREAM (FEET) = 1925.82  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 3416.13 CHANNEL SLOPE = 0.0165  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 8.63  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.407  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	127.40	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2135.70  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.09  
 AVERAGE FLOW DEPTH (FEET) = 8.62 TRAVEL TIME (MIN.) = 6.26  
 Tc (MIN.) = 73.76  
 SUBAREA AREA (ACRES) = 127.40 SUBAREA RUNOFF (CFS) = 126.98  
 EFFECTIVE AREA (ACRES) = 2134.14 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 2134.1 PEAK FLOW RATE (CFS) = 2127.15  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 8.61

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 8.61 FLOW VELOCITY (FEET/SEC.) = 9.08  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10222.00 = 31577.52 FEET.

=====  
 END OF STUDY SUMMARY:  
 TOTAL AREA (ACRES) = 2134.1 TC (MIN.) = 73.76  
 EFFECTIVE AREA (ACRES) = 2134.14 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.000  
 PEAK FLOW RATE (CFS) = 2127.15  
 =====

=====  
 END OF RATIONAL METHOD ANALYSIS  
 =====



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

Analysis prepared by:

-----  
FILE NAME: S2.DAT  
TIME/DATE OF STUDY: 09:56 04/01/2013  
=====

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--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*

NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 7.467
- 2) 10.00; 4.574
- 3) 15.00; 3.440
- 4) 20.00; 2.741
- 5) 25.00; 2.327
- 6) 30.00; 2.069
- 7) 40.00; 1.809
- 8) 50.00; 1.532
- 9) 60.00; 1.498
- 10) 90.00; 1.307
- 11) 120.00; 1.177
- 12) 180.00; 1.014
- 13) 360.00; 0.790
- 14) 1440.00; 0.359

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 10200.00 TO NODE 10201.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 301.66  
ELEVATION DATA: UPSTREAM(FEET) = 3087.44 DOWNSTREAM(FEET) = 3031.53

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.705  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.744  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	1.09	0.30	1.000	0	9.71

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 4.36  
 TOTAL AREA(ACRES) = 1.09 PEAK FLOW RATE(CFS) = 4.36

\*\*\*\*\*

FLOW PROCESS FROM NODE 10201.00 TO NODE 10202.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3031.53 DOWNSTREAM(FEET) = 2903.38  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 538.03 CHANNEL SLOPE = 0.2382  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.25  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.193  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	4.06	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.49  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.54  
 AVERAGE FLOW DEPTH(FEET) = 0.24 TRAVEL TIME(MIN.) = 1.97  
 Tc(MIN.) = 11.68  
 SUBAREA AREA(ACRES) = 4.06 SUBAREA RUNOFF(CFS) = 14.23  
 EFFECTIVE AREA(ACRES) = 5.15 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 5.2 PEAK FLOW RATE(CFS) = 18.05  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.32 FLOW VELOCITY(FEET/SEC.) = 5.34  
 LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10202.00 = 839.69 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10202.00 TO NODE 10203.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2903.38 DOWNSTREAM(FEET) = 2639.65  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1124.98 CHANNEL SLOPE = 0.2344  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.77

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.711

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	36.13	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 73.76

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.82

AVERAGE FLOW DEPTH(FEET) = 0.73 TRAVEL TIME(MIN.) = 2.13

Tc(MIN.) = 13.80

SUBAREA AREA(ACRES) = 36.13 SUBAREA RUNOFF(CFS) = 110.93

EFFECTIVE AREA(ACRES) = 41.28 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 41.3 PEAK FLOW RATE(CFS) = 126.74

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.00

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.00 FLOW VELOCITY(FEET/SEC.) = 10.60

LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10203.00 = 1964.67 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10203.00 TO NODE 10204.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2639.65 DOWNSTREAM(FEET) = 2444.90  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1897.75 CHANNEL SLOPE = 0.1026  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.69

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.126

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	56.14	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 198.42

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.19

AVERAGE FLOW DEPTH(FEET) = 1.63 TRAVEL TIME(MIN.) = 3.44

Tc(MIN.) = 17.24

SUBAREA AREA(ACRES) = 56.14 SUBAREA RUNOFF(CFS) = 142.81

EFFECTIVE AREA(ACRES) = 97.42 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 97.4 PEAK FLOW RATE(CFS) = 247.81

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.84

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.84 FLOW VELOCITY(FEET/SEC.) = 9.83

LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10204.00 = 3862.42 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10204.00 TO NODE 10205.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2444.90 DOWNSTREAM(FEET) = 2245.64  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1973.02 CHANNEL SLOPE = 0.1010  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.93

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.752

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	264.47	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 540.57

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.27

AVERAGE FLOW DEPTH(FEET) = 2.82 TRAVEL TIME(MIN.) = 2.68

Tc(MIN.) = 19.92

SUBAREA AREA(ACRES) = 264.47 SUBAREA RUNOFF(CFS) = 583.55

EFFECTIVE AREA(ACRES) = 361.89 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 361.9 PEAK FLOW RATE(CFS) = 798.50

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.45

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.45 FLOW VELOCITY(FEET/SEC.) = 13.69

LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10205.00 = 5835.44 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10205.00 TO NODE 10206.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2245.64 DOWNSTREAM(FEET) = 2157.91  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1870.92 CHANNEL SLOPE = 0.0469  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.87

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.515

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	255.55	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1053.50  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.14  
 AVERAGE FLOW DEPTH(FEET) = 4.82 TRAVEL TIME(MIN.) = 2.80  
 Tc(MIN.) = 22.72  
 SUBAREA AREA(ACRES) = 255.55 SUBAREA RUNOFF(CFS) = 509.56  
 EFFECTIVE AREA(ACRES) = 617.44 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 617.4 PEAK FLOW RATE(CFS) = 1231.17  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.20

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 5.20 FLOW VELOCITY(FEET/SEC.) = 11.61  
 LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10206.00 = 7706.36 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10206.00 TO NODE 10206.50 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2157.91 DOWNSTREAM(FEET) = 2119.30  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1453.59 CHANNEL SLOPE = 0.0266  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 6.28  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.315

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	141.47	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1359.49  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.66  
 AVERAGE FLOW DEPTH(FEET) = 6.25 TRAVEL TIME(MIN.) = 2.51  
 Tc(MIN.) = 25.23  
 SUBAREA AREA(ACRES) = 141.47 SUBAREA RUNOFF(CFS) = 256.58  
 EFFECTIVE AREA(ACRES) = 758.91 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 758.9 PEAK FLOW RATE(CFS) = 1376.40  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 6.29

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 6.29 FLOW VELOCITY(FEET/SEC.) = 9.69  
 LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10206.50 = 9159.95 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10206.50 TO NODE 10220.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2119.30 DOWNSTREAM(FEET) = 2093.25  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2020.48 CHANNEL SLOPE = 0.0129  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 7.69  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.084

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	105.39	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1461.05  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.53  
 AVERAGE FLOW DEPTH(FEET) = 7.66 TRAVEL TIME(MIN.) = 4.47  
 Tc(MIN.) = 29.70  
 SUBAREA AREA(ACRES) = 105.39 SUBAREA RUNOFF(CFS) = 169.25  
 EFFECTIVE AREA(ACRES) = 864.30 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 864.3 PEAK FLOW RATE(CFS) = 1388.01  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 7.48

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 7.48 FLOW VELOCITY(FEET/SEC.) = 7.43  
 LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10220.00 = 11180.43 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10206.50 TO NODE 10220.00 IS CODE = 1

-----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 29.70  
 RAINFALL INTENSITY(INCH/HR) = 2.08  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 864.30  
 TOTAL STREAM AREA(ACRES) = 864.30  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 1388.01

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10210.00 TO NODE 10211.00 IS CODE = 21

-----  
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 890.82  
 ELEVATION DATA: UPSTREAM(FEET) = 2966.08 DOWNSTREAM(FEET) = 2867.74

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 16.601  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.216  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc
USER-DEFINED	-	105.39	0.30	1.000	-	

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
 NATURAL FAIR COVER  
 "CHAPARRAL, BROADLEAF" - 7.25 0.30 1.000 0 16.60  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF (CFS) = 19.03  
 TOTAL AREA (ACRES) = 7.25 PEAK FLOW RATE (CFS) = 19.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10211.00 TO NODE 10212.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2867.74 DOWNSTREAM (FEET) = 2763.75  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1682.06 CHANNEL SLOPE = 0.0618  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.97  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.565

SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 33.02 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 53.05  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.07  
 AVERAGE FLOW DEPTH (FEET) = 0.89 TRAVEL TIME (MIN.) = 5.53  
 Tc (MIN.) = 22.13  
 SUBAREA AREA (ACRES) = 33.02 SUBAREA RUNOFF (CFS) = 67.31  
 EFFECTIVE AREA (ACRES) = 40.27 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 40.3 PEAK FLOW RATE (CFS) = 82.09  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.14

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.14 FLOW VELOCITY (FEET/SEC.) = 5.85  
 LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10212.00 = 2572.88 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10212.00 TO NODE 10213.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2763.75 DOWNSTREAM (FEET) = 2662.20  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1206.59 CHANNEL SLOPE = 0.0842  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.50  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.353

SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 71.89 0.30 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 148.60  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.86  
 AVERAGE FLOW DEPTH (FEET) = 1.46 TRAVEL TIME (MIN.) = 2.56  
 Tc (MIN.) = 24.68  
 SUBAREA AREA (ACRES) = 71.89 SUBAREA RUNOFF (CFS) = 132.85  
 EFFECTIVE AREA (ACRES) = 112.16 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 112.2 PEAK FLOW RATE (CFS) = 207.27  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.76

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.76 FLOW VELOCITY (FEET/SEC.) = 8.71  
 LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10213.00 = 3779.47 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10213.00 TO NODE 10214.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2662.20 DOWNSTREAM (FEET) = 2520.73  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1783.17 CHANNEL SLOPE = 0.0793  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.48  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.191

SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 182.61 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 362.77  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.05  
 AVERAGE FLOW DEPTH (FEET) = 2.43 TRAVEL TIME (MIN.) = 2.96  
 Tc (MIN.) = 27.64  
 SUBAREA AREA (ACRES) = 182.61 SUBAREA RUNOFF (CFS) = 310.76  
 EFFECTIVE AREA (ACRES) = 294.77 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 294.8 PEAK FLOW RATE (CFS) = 501.63  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.89

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.89 FLOW VELOCITY (FEET/SEC.) = 11.02  
 LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10214.00 = 5562.64 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10214.00 TO NODE 10215.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2520.73 DOWNSTREAM(FEET) = 2270.71  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2774.20 CHANNEL SLOPE = 0.0901  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.16  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.032  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 156.94 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 624.02  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.26  
 AVERAGE FLOW DEPTH(FEET) = 3.13 TRAVEL TIME(MIN.) = 3.77  
 Tc(MIN.) = 31.41  
 SUBAREA AREA(ACRES) = 156.94 SUBAREA RUNOFF(CFS) = 244.69  
 EFFECTIVE AREA(ACRES) = 451.71 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 451.7 PEAK FLOW RATE(CFS) = 704.27  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.33  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.33 FLOW VELOCITY(FEET/SEC.) = 12.69  
 LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10215.00 = 8336.84 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10215.00 TO NODE 10216.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 2270.71 DOWNSTREAM(FEET) = 2151.20  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2019.75 CHANNEL SLOPE = 0.0592  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.97  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.955  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 130.62 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 801.54  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.28  
 AVERAGE FLOW DEPTH(FEET) = 3.96 TRAVEL TIME(MIN.) = 2.98  
 Tc(MIN.) = 34.40  
 SUBAREA AREA(ACRES) = 130.62 SUBAREA RUNOFF(CFS) = 194.53  
 EFFECTIVE AREA(ACRES) = 582.33 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 582.3 PEAK FLOW RATE(CFS) = 867.27  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.12

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.12 FLOW VELOCITY(FEET/SEC.) = 11.52  
 LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10216.00 = 10356.59 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10216.00 TO NODE 10216.50 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 2151.20 DOWNSTREAM(FEET) = 2120.63  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1242.42 CHANNEL SLOPE = 0.0246  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.24  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.891  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 51.25 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 903.96  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.45  
 AVERAGE FLOW DEPTH(FEET) = 5.23 TRAVEL TIME(MIN.) = 2.45  
 Tc(MIN.) = 36.85  
 SUBAREA AREA(ACRES) = 51.25 SUBAREA RUNOFF(CFS) = 73.39  
 EFFECTIVE AREA(ACRES) = 633.58 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 633.6 PEAK FLOW RATE(CFS) = 907.25  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.24  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 5.24 FLOW VELOCITY(FEET/SEC.) = 8.46  
 LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10216.50 = 11599.01 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10216.50 TO NODE 10220.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 2120.63 DOWNSTREAM(FEET) = 2093.25  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1301.06 CHANNEL SLOPE = 0.0210  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.50  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.821  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 26.16 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 925.15  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.02

AVERAGE FLOW DEPTH (FEET) = 5.50 TRAVEL TIME (MIN.) = 2.70  
Tc (MIN.) = 39.55  
SUBAREA AREA (ACRES) = 26.16 SUBAREA RUNOFF (CFS) = 35.80  
EFFECTIVE AREA (ACRES) = 659.74 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 659.7 PEAK FLOW RATE (CFS) = 907.25  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.44

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 5.44 FLOW VELOCITY (FEET/SEC.) = 7.98  
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10220.00 = 12900.07 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10216.50 TO NODE 10220.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION (MIN.) = 39.55  
RAINFALL INTENSITY (INCH/HR) = 1.82  
AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA (ACRES) = 659.74  
TOTAL STREAM AREA (ACRES) = 659.74  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 907.25

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1388.01	29.70	2.084	0.30 (0.30)	1.00	864.3	10200.00
2	907.25	39.55	1.821	0.30 (0.30)	1.00	659.7	10210.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2187.49	29.70	2.084	0.30 (0.30)	1.00	1359.8	10200.00
2	2090.18	39.55	1.821	0.30 (0.30)	1.00	1524.0	10210.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
PEAK FLOW RATE (CFS) = 2187.49 Tc (MIN.) = 29.70  
EFFECTIVE AREA (ACRES) = 1359.77 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 1524.0  
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10220.00 = 12900.07 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10220.00 TO NODE 10221.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2093.25 DOWNSTREAM (FEET) = 1965.76  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2966.11 CHANNEL SLOPE = 0.0430  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 7.11  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.979  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	104.45	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2266.42  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 13.19  
AVERAGE FLOW DEPTH (FEET) = 7.10 TRAVEL TIME (MIN.) = 3.75  
Tc (MIN.) = 33.45

SUBAREA AREA (ACRES) = 104.45 SUBAREA RUNOFF (CFS) = 157.87  
EFFECTIVE AREA (ACRES) = 1464.22 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 1628.5 PEAK FLOW RATE (CFS) = 2213.03  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 7.02

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 7.02 FLOW VELOCITY (FEET/SEC.) = 13.11  
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10221.00 = 15866.18 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10221.00 TO NODE 10221.50 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 1965.76 DOWNSTREAM (FEET) = 1950.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1346.48 CHANNEL SLOPE = 0.0117  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 9.71  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.908

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	169.50	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2335.69  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.19  
AVERAGE FLOW DEPTH (FEET) = 9.70 TRAVEL TIME (MIN.) = 2.74  
Tc (MIN.) = 36.19

SUBAREA AREA (ACRES) = 169.50 SUBAREA RUNOFF (CFS) = 245.32  
EFFECTIVE AREA (ACRES) = 1633.72 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 1798.0 PEAK FLOW RATE (CFS) = 2364.47  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 9.75

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 9.75 FLOW VELOCITY (FEET/SEC.) = 8.22

LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10221.50 = 17212.66 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10221.50 TO NODE 10222.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 1950.00 DOWNSTREAM (FEET) = 1925.82

CHANNEL LENGTH THRU SUBAREA (FEET) = 1849.80 CHANNEL SLOPE = 0.0131

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 9.57

\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.815

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

USER-DEFINED - 43.12 0.30 1.000 -

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2393.86

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.58

AVERAGE FLOW DEPTH (FEET) = 9.57 TRAVEL TIME (MIN.) = 3.59

Tc (MIN.) = 39.78

SUBAREA AREA (ACRES) = 43.12 SUBAREA RUNOFF (CFS) = 58.78

EFFECTIVE AREA (ACRES) = 1676.84 AREA-AVERAGED Fm (INCH/HR) = 0.30

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 1841.1 PEAK FLOW RATE (CFS) = 2364.47

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 9.52

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 9.52 FLOW VELOCITY (FEET/SEC.) = 8.56

LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10222.00 = 19062.46 FEET.

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 1841.1 TC (MIN.) = 39.78

EFFECTIVE AREA (ACRES) = 1676.84 AREA-AVERAGED Fm (INCH/HR) = 0.30

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.000

PEAK FLOW RATE (CFS) = 2364.47

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2364.47	39.78	1.815	0.30 (0.30)	1.00	1676.8	10200.00
2	2167.08	49.80	1.537	0.30 (0.30)	1.00	1841.1	10210.00

END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

-----  
FILE NAME: S3.DAT  
TIME/DATE OF STUDY: 09:57 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 7.487
- 2) 10.00; 4.584
- 3) 15.00; 3.447
- 4) 20.00; 2.745
- 5) 25.00; 2.329
- 6) 30.00; 2.071
- 7) 40.00; 1.811
- 8) 50.00; 1.534
- 9) 60.00; 1.500
- 10) 90.00; 1.310
- 11) 120.00; 1.180
- 12) 180.00; 1.017
- 13) 360.00; 0.792
- 14) 1440.00; 0.360

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10300.00 TO NODE 10301.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH (FEET) = 310.52  
ELEVATION DATA: UPSTREAM (FEET) = 4227.21 DOWNSTREAM (FEET) = 4064.64

Tc = K \* [(LENGTH\*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20  
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 7.977  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 5.758  
SUBAREA Tc AND LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" - 1.00 0.30 1.000 0 7.98  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF (CFS) = 4.91  
TOTAL AREA (ACRES) = 1.00 PEAK FLOW RATE (CFS) = 4.91

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10301.00 TO NODE 10302.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<<  
=====

ELEVATION DATA: UPSTREAM (FEET) = 4064.64 DOWNSTREAM (FEET) = 3797.25  
CHANNEL LENGTH THRU SUBAREA (FEET) = 631.34 CHANNEL SLOPE = 0.4235  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.29  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 4.796  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN  
USER-DEFINED - 6.23 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 17.66  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.35  
AVERAGE FLOW DEPTH (FEET) = 0.26 TRAVEL TIME (MIN.) = 1.66  
Tc (MIN.) = 9.63  
SUBAREA AREA (ACRES) = 6.23 SUBAREA RUNOFF (CFS) = 25.21  
EFFECTIVE AREA (ACRES) = 7.23 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 7.2 PEAK FLOW RATE (CFS) = 29.26  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.36

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.36 FLOW VELOCITY (FEET/SEC.) = 7.68  
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10302.00 = 941.86 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10302.00 TO NODE 10303.00 IS CODE = 56



-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3797.25 DOWNSTREAM(FEET) = 3447.07  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1908.89 CHANNEL SLOPE = 0.1834  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.91

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.805

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	32.83	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 81.75

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.40

AVERAGE FLOW DEPTH(FEET) = 0.83 TRAVEL TIME(MIN.) = 3.79

Tc(MIN.) = 13.42

SUBAREA AREA(ACRES) = 32.83 SUBAREA RUNOFF(CFS) = 103.58

EFFECTIVE AREA(ACRES) = 40.06 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 40.1 PEAK FLOW RATE(CFS) = 126.39

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.07

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.07 FLOW VELOCITY(FEET/SEC.) = 9.72

LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10303.00 = 2850.75 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10303.00 TO NODE 10304.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3447.07 DOWNSTREAM(FEET) = 3228.48  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1918.05 CHANNEL SLOPE = 0.1140  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.68

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.203

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	60.51	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 205.73

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.65

AVERAGE FLOW DEPTH(FEET) = 1.61 TRAVEL TIME(MIN.) = 3.31

Tc(MIN.) = 16.74

SUBAREA AREA(ACRES) = 60.51 SUBAREA RUNOFF(CFS) = 158.10

EFFECTIVE AREA(ACRES) = 100.57 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 100.6 PEAK FLOW RATE(CFS) = 262.77

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.85

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.85 FLOW VELOCITY(FEET/SEC.) = 10.37

LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10304.00 = 4768.80 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10304.00 TO NODE 10305.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3228.48 DOWNSTREAM(FEET) = 3118.37  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1679.40 CHANNEL SLOPE = 0.0656  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.74

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.794

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	116.56	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 393.94

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.60

AVERAGE FLOW DEPTH(FEET) = 2.67 TRAVEL TIME(MIN.) = 2.91

Tc(MIN.) = 19.65

SUBAREA AREA(ACRES) = 116.56 SUBAREA RUNOFF(CFS) = 261.62

EFFECTIVE AREA(ACRES) = 217.13 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 217.1 PEAK FLOW RATE(CFS) = 487.35

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.99

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.99 FLOW VELOCITY(FEET/SEC.) = 10.21

LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10305.00 = 6448.20 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10305.00 TO NODE 10306.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3118.37 DOWNSTREAM(FEET) = 2807.99  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2853.67 CHANNEL SLOPE = 0.1088  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.16

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.479

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	189.23	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 673.17  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.40  
 AVERAGE FLOW DEPTH(FEET) = 3.10 TRAVEL TIME(MIN.) = 3.55  
 Tc(MIN.) = 23.20  
 SUBAREA AREA(ACRES) = 189.23 SUBAREA RUNOFF(CFS) = 371.05  
 EFFECTIVE AREA(ACRES) = 406.36 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 406.4 PEAK FLOW RATE(CFS) = 796.82  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.38

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.38 FLOW VELOCITY(FEET/SEC.) = 14.05  
 LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10306.00 = 9301.87 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10306.00 TO NODE 10307.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2807.99 DOWNSTREAM(FEET) = 2591.87  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2848.03 CHANNEL SLOPE = 0.0759  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.57  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.242

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	416.51	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1161.23  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.66  
 AVERAGE FLOW DEPTH(FEET) = 4.48 TRAVEL TIME(MIN.) = 3.48  
 Tc(MIN.) = 26.68  
 SUBAREA AREA(ACRES) = 416.51 SUBAREA RUNOFF(CFS) = 728.18  
 EFFECTIVE AREA(ACRES) = 822.87 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 822.9 PEAK FLOW RATE(CFS) = 1438.61  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.98

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.98 FLOW VELOCITY(FEET/SEC.) = 14.45  
 LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10307.00 = 12149.90 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10307.00 TO NODE 10308.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2591.87 DOWNSTREAM(FEET) = 2516.62  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2862.06 CHANNEL SLOPE = 0.0263  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 7.00  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.036

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	320.49	0.30	0.986	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.986  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1689.62  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.18  
 AVERAGE FLOW DEPTH(FEET) = 6.95 TRAVEL TIME(MIN.) = 4.68  
 Tc(MIN.) = 31.36  
 SUBAREA AREA(ACRES) = 320.49 SUBAREA RUNOFF(CFS) = 501.85  
 EFFECTIVE AREA(ACRES) = 1143.36 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 1143.4 PEAK FLOW RATE(CFS) = 1787.25  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 7.13

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 7.13 FLOW VELOCITY(FEET/SEC.) = 10.34  
 LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10308.00 = 15011.96 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10308.00 TO NODE 10308.50 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2516.62 DOWNSTREAM(FEET) = 2462.25  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1889.32 CHANNEL SLOPE = 0.0288  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 7.25  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.961

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	191.88	0.30	0.966	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.966  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1931.53  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.90  
 AVERAGE FLOW DEPTH(FEET) = 7.24 TRAVEL TIME(MIN.) = 2.89  
 Tc(MIN.) = 34.25  
 SUBAREA AREA(ACRES) = 191.88 SUBAREA RUNOFF(CFS) = 288.53  
 EFFECTIVE AREA(ACRES) = 1335.24 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 1335.2 PEAK FLOW RATE(CFS) = 1998.52  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 7.35

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 7.35 FLOW VELOCITY(FEET/SEC.) = 11.00  
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10308.50 = 16901.28 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10308.50 TO NODE 10309.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2462.25 DOWNSTREAM(FEET) = 2409.87  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1874.33 CHANNEL SLOPE = 0.0279  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.52  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.887

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	90.14	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2062.88  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.97  
AVERAGE FLOW DEPTH(FEET) = 7.51 TRAVEL TIME(MIN.) = 2.85  
Tc(MIN.) = 37.10  
SUBAREA AREA(ACRES) = 90.14 SUBAREA RUNOFF(CFS) = 128.71  
EFFECTIVE AREA(ACRES) = 1425.38 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 1425.4 PEAK FLOW RATE(CFS) = 2038.29  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.47

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 7.47 FLOW VELOCITY(FEET/SEC.) = 10.94  
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10309.00 = 18775.61 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10309.00 TO NODE 10330.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2409.87 DOWNSTREAM(FEET) = 2330.13  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2576.20 CHANNEL SLOPE = 0.0310  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.40  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.787

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	83.83	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2094.41  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.44

AVERAGE FLOW DEPTH(FEET) = 7.39 TRAVEL TIME(MIN.) = 3.75  
Tc(MIN.) = 40.85  
SUBAREA AREA(ACRES) = 83.83 SUBAREA RUNOFF(CFS) = 112.23  
EFFECTIVE AREA(ACRES) = 1509.21 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 1509.2 PEAK FLOW RATE(CFS) = 2038.29  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.30

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 7.30 FLOW VELOCITY(FEET/SEC.) = 11.36  
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10330.00 = 21351.81 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10309.00 TO NODE 10330.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 40.85  
RAINFALL INTENSITY(INCH/HR) = 1.79  
AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.99  
EFFECTIVE STREAM AREA(ACRES) = 1509.21  
TOTAL STREAM AREA(ACRES) = 1509.21  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 2038.29

\*\*\*\*\*

FLOW PROCESS FROM NODE 10320.00 TO NODE 10321.00 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
INITIAL SUBAREA FLOW-LENGTH(FEET) = 290.56  
ELEVATION DATA: UPSTREAM(FEET) = 3374.80 DOWNSTREAM(FEET) = 3300.24

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.959  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.189  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	2.24	0.30	1.000	0	8.96

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 9.86  
TOTAL AREA(ACRES) = 2.24 PEAK FLOW RATE(CFS) = 9.86

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FLOW PROCESS FROM NODE 10321.00 TO NODE 10322.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 3300.24 DOWNSTREAM(FEET) = 3187.21
CHANNEL LENGTH THRU SUBAREA(FEET) = 581.07 CHANNEL SLOPE = 0.1945
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 0.37
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.392
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/    SCS SOIL  AREA      Fp        Ap    SCS
  LAND USE          GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED         -         5.01    0.30    1.000    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 19.11
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.13
AVERAGE FLOW DEPTH(FEET) = 0.35 TRAVEL TIME(MIN.) = 1.89
Tc(MIN.) = 10.85
SUBAREA AREA(ACRES) = 5.01 SUBAREA RUNOFF(CFS) = 18.45
EFFECTIVE AREA(ACRES) = 7.25 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 7.2 PEAK FLOW RATE(CFS) = 26.70
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 0.42

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.42 FLOW VELOCITY(FEET/SEC.) = 5.80
LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10322.00 = 871.63 FEET.

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FLOW PROCESS FROM NODE 10322.00 TO NODE 10323.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 3187.21 DOWNSTREAM(FEET) = 3108.86
CHANNEL LENGTH THRU SUBAREA(FEET) = 977.98 CHANNEL SLOPE = 0.0801
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.06
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.793
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/    SCS SOIL  AREA      Fp        Ap    SCS
  LAND USE          GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED         -        30.37   0.30    1.000    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 74.71
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.20
AVERAGE FLOW DEPTH(FEET) = 1.00 TRAVEL TIME(MIN.) = 2.63
Tc(MIN.) = 13.48
SUBAREA AREA(ACRES) = 30.37 SUBAREA RUNOFF(CFS) = 95.49
EFFECTIVE AREA(ACRES) = 37.62 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 37.6 PEAK FLOW RATE(CFS) = 118.28
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.30

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.30 FLOW VELOCITY(FEET/SEC.) = 7.21
LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10323.00 = 1849.61 FEET.

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FLOW PROCESS FROM NODE 10323.00 TO NODE 10324.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 3108.86 DOWNSTREAM(FEET) = 2923.03
CHANNEL LENGTH THRU SUBAREA(FEET) = 1924.11 CHANNEL SLOPE = 0.0966
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.78
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.168
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/    SCS SOIL  AREA      Fp        Ap    SCS
  LAND USE          GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED         -        68.88   0.30    1.000    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 207.58
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.14
AVERAGE FLOW DEPTH(FEET) = 1.70 TRAVEL TIME(MIN.) = 3.51
Tc(MIN.) = 16.99
SUBAREA AREA(ACRES) = 68.88 SUBAREA RUNOFF(CFS) = 177.80
EFFECTIVE AREA(ACRES) = 106.50 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 106.5 PEAK FLOW RATE(CFS) = 274.90
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.98

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.98 FLOW VELOCITY(FEET/SEC.) = 9.94
LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10324.00 = 3773.72 FEET.

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FLOW PROCESS FROM NODE 10324.00 TO NODE 10325.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 2923.03 DOWNSTREAM(FEET) = 2675.11
CHANNEL LENGTH THRU SUBAREA(FEET) = 2788.58 CHANNEL SLOPE = 0.0889
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.68
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.643
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/    SCS SOIL  AREA      Fp        Ap    SCS
  LAND USE          GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED         -        146.19   0.30    1.000    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 429.62

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TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.98  
AVERAGE FLOW DEPTH (FEET) = 2.58 TRAVEL TIME (MIN.) = 4.23  
Tc (MIN.) = 21.22  
SUBAREA AREA (ACRES) = 146.19 SUBAREA RUNOFF (CFS) = 308.32  
EFFECTIVE AREA (ACRES) = 252.69 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 252.7 PEAK FLOW RATE (CFS) = 532.94  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.89

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 2.89 FLOW VELOCITY (FEET/SEC.) = 11.69  
LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10325.00 = 6562.30 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10325.00 TO NODE 10326.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2675.11 DOWNSTREAM (FEET) = 2541.92  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2862.28 CHANNEL SLOPE = 0.0465  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 4.39  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.287

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 321.78 0.30 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 821.27  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.40  
AVERAGE FLOW DEPTH (FEET) = 4.26 TRAVEL TIME (MIN.) = 4.59  
Tc (MIN.) = 25.81

SUBAREA AREA (ACRES) = 321.78 SUBAREA RUNOFF (CFS) = 575.55  
EFFECTIVE AREA (ACRES) = 574.47 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 574.5 PEAK FLOW RATE (CFS) = 1027.52  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 4.76

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 4.76 FLOW VELOCITY (FEET/SEC.) = 11.05  
LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10326.00 = 9424.58 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10326.00 TO NODE 10326.50 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2541.92 DOWNSTREAM (FEET) = 2438.80  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2617.40 CHANNEL SLOPE = 0.0394  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.34  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.078  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 187.06 0.30 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1177.29  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.77  
AVERAGE FLOW DEPTH (FEET) = 5.31 TRAVEL TIME (MIN.) = 4.05  
Tc (MIN.) = 29.86

SUBAREA AREA (ACRES) = 187.06 SUBAREA RUNOFF (CFS) = 299.39  
EFFECTIVE AREA (ACRES) = 761.53 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 761.5 PEAK FLOW RATE (CFS) = 1218.82  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.40

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 5.40 FLOW VELOCITY (FEET/SEC.) = 10.86  
LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10326.50 = 12041.98 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10326.50 TO NODE 10327.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2438.80 DOWNSTREAM (FEET) = 2414.64  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1181.79 CHANNEL SLOPE = 0.0204  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 6.47  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.015

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 82.27 0.30 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1282.33  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.65  
AVERAGE FLOW DEPTH (FEET) = 6.47 TRAVEL TIME (MIN.) = 2.28  
Tc (MIN.) = 32.14

SUBAREA AREA (ACRES) = 82.27 SUBAREA RUNOFF (CFS) = 127.02  
EFFECTIVE AREA (ACRES) = 843.80 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 843.8 PEAK FLOW RATE (CFS) = 1302.78  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 6.52

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 6.52 FLOW VELOCITY (FEET/SEC.) = 8.68  
LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10327.00 = 13223.77 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10327.00 TO NODE 10327.50 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2414.64 DOWNSTREAM(FEET) = 2389.73

CHANNEL LENGTH THRU SUBAREA(FEET) = 2431.92 CHANNEL SLOPE = 0.0102

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.15

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.863

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	243.69	0.30	0.997	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.997

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1474.38

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.93

AVERAGE FLOW DEPTH(FEET) = 8.11 TRAVEL TIME(MIN.) = 5.85

Tc(MIN.) = 37.99

SUBAREA AREA(ACRES) = 243.69 SUBAREA RUNOFF(CFS) = 343.09

EFFECTIVE AREA(ACRES) = 1087.49 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1087.5 PEAK FLOW RATE(CFS) = 1530.37

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.25

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.25 FLOW VELOCITY(FEET/SEC.) = 7.00

LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10327.50 = 15655.69 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10327.50 TO NODE 10330.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2389.73 DOWNSTREAM(FEET) = 2330.13

CHANNEL LENGTH THRU SUBAREA(FEET) = 1944.59 CHANNEL SLOPE = 0.0306

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.49

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.782

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	69.36	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1576.63

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.59

AVERAGE FLOW DEPTH(FEET) = 6.48 TRAVEL TIME(MIN.) = 3.06

Tc(MIN.) = 41.05

SUBAREA AREA(ACRES) = 69.36 SUBAREA RUNOFF(CFS) = 92.52

EFFECTIVE AREA(ACRES) = 1156.85 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1156.8 PEAK FLOW RATE(CFS) = 1543.28

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.42

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 6.42 FLOW VELOCITY(FEET/SEC.) = 10.53

LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10330.00 = 17600.28 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10327.50 TO NODE 10330.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 41.05

RAINFALL INTENSITY(INCH/HR) = 1.78

AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA(ACRES) = 1156.85

TOTAL STREAM AREA(ACRES) = 1156.85

PEAK FLOW RATE(CFS) AT CONFLUENCE = 1543.28

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2038.29	40.85	1.787	0.30( 0.30)	0.99	1509.2	10300.00
2	1543.28	41.05	1.782	0.30( 0.30)	1.00	1156.8	10320.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3579.83	40.85	1.787	0.30( 0.30)	1.00	2660.5	10300.00
2	3574.13	41.05	1.782	0.30( 0.30)	1.00	2666.1	10320.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 3579.83 Tc(MIN.) = 40.85

EFFECTIVE AREA(ACRES) = 2660.52 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 2666.1

LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10330.00 = 21351.81 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10330.00 TO NODE 10331.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2330.13 DOWNSTREAM(FEET) = 2041.66

CHANNEL LENGTH THRU SUBAREA(FEET) = 3034.53 CHANNEL SLOPE = 0.0951

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 7.35  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.717  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	70.23	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 3624.62  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 19.99  
 AVERAGE FLOW DEPTH (FEET) = 7.34 TRAVEL TIME (MIN.) = 2.53  
 Tc (MIN.) = 43.38  
 SUBAREA AREA (ACRES) = 70.23 SUBAREA RUNOFF (CFS) = 89.59  
 EFFECTIVE AREA (ACRES) = 2730.75 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 2736.3 PEAK FLOW RATE (CFS) = 3579.83  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 7.30

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 7.30 FLOW VELOCITY (FEET/SEC.) = 19.92  
 LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10331.00 = 24386.34 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10331.00 TO NODE 10332.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 2041.66 DOWNSTREAM (FEET) = 1739.96  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 3264.87 CHANNEL SLOPE = 0.0924  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 7.42  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.641  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	104.94	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 3643.17  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 19.80  
 AVERAGE FLOW DEPTH (FEET) = 7.41 TRAVEL TIME (MIN.) = 2.75  
 Tc (MIN.) = 46.13  
 SUBAREA AREA (ACRES) = 104.94 SUBAREA RUNOFF (CFS) = 126.68  
 EFFECTIVE AREA (ACRES) = 2835.69 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 2841.2 PEAK FLOW RATE (CFS) = 3579.83  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 7.35

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 7.35 FLOW VELOCITY (FEET/SEC.) = 19.71  
 LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10332.00 = 27651.21 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10331.00 TO NODE 10332.00 IS CODE = 10  
 -----

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

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10112.50 TO NODE 10222.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 2 <<<<<  
 =====

PEAK FLOWRATE TABLE FILE NAME: S1.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2127.15	73.76	0.30 ( 0.30)	1.00	2134.1	10100.00
TOTAL AREA (ACRES) =						2134.1

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10221.50 TO NODE 10222.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 3 <<<<<  
 =====

PEAK FLOWRATE TABLE FILE NAME: S2.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2364.47	39.78	0.30 ( 0.30)	1.00	1676.8	10200.00
2	2167.08	49.80	0.30 ( 0.30)	1.00	1841.1	10210.00
TOTAL AREA (ACRES) =						1841.1

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10221.50 TO NODE 10222.00 IS CODE = 14.0  
 -----

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
 =====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2364.47	39.78	0.30 ( 0.30)	1.00	1676.8	10200.00
2	2167.08	49.80	0.30 ( 0.30)	1.00	1841.1	10210.00
TOTAL AREA (ACRES) =						1841.1

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10112.50 TO NODE 10222.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<  
 =====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2364.47	39.78	1.817	0.30 ( 0.30)	1.00	1676.8	10200.00

2 2167.08 49.80 1.539 0.30( 0.30) 1.00 1841.1 10210.00  
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10222.00 = 19062.46 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2127.15	73.76	1.413	0.30( 0.30)	1.00	2134.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10222.00 = 31577.52 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3928.04	39.78	1.817	0.30( 0.30)	1.00	2827.9	10200.00
2	3766.75	49.80	1.539	0.30( 0.30)	1.00	3282.1	10210.00
3	4072.89	73.76	1.413	0.30( 0.30)	1.00	3975.2	10100.00

TOTAL AREA (ACRES) = 3975.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 4072.89 Tc(MIN.) = 73.758  
EFFECTIVE AREA(ACRES) = 3975.25 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 3975.2  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10222.00 = 31577.52 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10222.00 TO NODE 10332.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1925.82 DOWNSTREAM(FEET) = 1739.96  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1475.92 CHANNEL SLOPE = 0.1259  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.27  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.406

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	19.92	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4082.81  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 22.87  
AVERAGE FLOW DEPTH(FEET) = 7.27 TRAVEL TIME(MIN.) = 1.08  
Tc(MIN.) = 74.83

SUBAREA AREA(ACRES) = 19.92 SUBAREA RUNOFF(CFS) = 19.83  
EFFECTIVE AREA(ACRES) = 3995.17 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 3995.2 PEAK FLOW RATE(CFS) = 4072.89  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.27

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 7.27 FLOW VELOCITY(FEET/SEC.) = 22.85  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10332.00 = 33053.44 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10331.00 TO NODE 10332.00 IS CODE = 11  
-----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3928.04	40.87	1.787	0.30( 0.30)	1.00	2847.8	10200.00
2	3766.75	50.90	1.531	0.30( 0.30)	1.00	3302.0	10210.00
3	4072.89	74.83	1.406	0.30( 0.30)	1.00	3995.2	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10332.00 = 33053.44 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3579.83	46.13	1.641	0.30( 0.30)	1.00	2835.7	10300.00
2	3574.13	46.33	1.636	0.30( 0.30)	1.00	2841.2	10320.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7443.85	40.87	1.787	0.30( 0.30)	1.00	5360.1	10200.00
2	7423.28	46.13	1.641	0.30( 0.30)	1.00	5921.7	10300.00
3	7414.38	46.33	1.636	0.30( 0.30)	1.00	5936.3	10320.00
4	7060.82	50.90	1.531	0.30( 0.30)	1.00	6143.3	10210.00
5	7033.11	74.83	1.406	0.30( 0.30)	1.00	6836.4	10100.00

TOTAL AREA(ACRES) = 6836.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 7443.85 Tc(MIN.) = 40.868  
EFFECTIVE AREA(ACRES) = 5360.12 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 6836.4  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10332.00 = 33053.44 FEET.

-----  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 6836.4 TC(MIN.) = 40.87  
EFFECTIVE AREA(ACRES) = 5360.12 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.998  
PEAK FLOW RATE(CFS) = 7443.85

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7443.85	40.87	1.787	0.30( 0.30)	1.00	5360.1	10200.00
2	7423.28	46.13	1.641	0.30( 0.30)	1.00	5921.7	10300.00
3	7414.38	46.33	1.636	0.30( 0.30)	1.00	5936.3	10320.00
4	7060.82	50.90	1.531	0.30( 0.30)	1.00	6143.3	10210.00
5	7033.11	74.83	1.406	0.30( 0.30)	1.00	6836.4	10100.00

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END OF RATIONAL METHOD ANALYSIS



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

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FILE NAME: S4.DAT  
TIME/DATE OF STUDY: 09:57 04/01/2013  
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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
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--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 7.393
- 2) 10.00; 4.538
- 3) 15.00; 3.417
- 4) 20.00; 2.726
- 5) 25.00; 2.316
- 6) 30.00; 2.059
- 7) 40.00; 1.800
- 8) 50.00; 1.526
- 9) 60.00; 1.488
- 10) 90.00; 1.297
- 11) 120.00; 1.166
- 12) 180.00; 1.004
- 13) 360.00; 0.780
- 14) 1440.00; 0.354

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	HALF- CROWN TO		STREET-CROSSFALL: IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES:			MANNING FACTOR (n)
	WIDTH (FT)	CROSSFALL (FT)			WIDTH (FT)	LIP (FT)	HIKE (FT)	
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

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

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 16.799  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.168  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 5.89 0.30 1.000 0 16.80  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 15.21  
TOTAL AREA(ACRES) = 5.89 PEAK FLOW RATE(CFS) = 15.21

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FLOW PROCESS FROM NODE 10401.00 TO NODE 10402.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
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ELEVATION DATA: UPSTREAM(FEET) = 2536.15 DOWNSTREAM(FEET) = 2504.36  
CHANNEL LENGTH THRU SUBAREA(FEET) = 934.06 CHANNEL SLOPE = 0.0340  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.87  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.632  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 17.57 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 33.75  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.58  
AVERAGE FLOW DEPTH(FEET) = 0.81 TRAVEL TIME(MIN.) = 4.35  
Tc(MIN.) = 21.15  
SUBAREA AREA(ACRES) = 17.57 SUBAREA RUNOFF(CFS) = 36.87  
EFFECTIVE AREA(ACRES) = 23.46 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 23.5 PEAK FLOW RATE(CFS) = 49.23  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.01

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.01 FLOW VELOCITY(FEET/SEC.) = 4.06  
LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10402.00 = 1884.48 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10402.00 TO NODE 10402.50 IS CODE = 56

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2504.36 DOWNSTREAM(FEET) = 2462.54  
CHANNEL LENGTH THRU SUBAREA(FEET) = 951.55 CHANNEL SLOPE = 0.0439  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.48

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.399

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	56.74	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 102.94

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.60

AVERAGE FLOW DEPTH(FEET) = 1.43 TRAVEL TIME(MIN.) = 2.83

Tc(MIN.) = 23.98

SUBAREA AREA(ACRES) = 56.74 SUBAREA RUNOFF(CFS) = 107.22

EFFECTIVE AREA(ACRES) = 80.20 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 80.2 PEAK FLOW RATE(CFS) = 151.55

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.77

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.77 FLOW VELOCITY(FEET/SEC.) = 6.31

LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10402.50 = 2836.03 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10402.50 TO NODE 10403.00 IS CODE = 56

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2462.54 DOWNSTREAM(FEET) = 2433.59  
CHANNEL LENGTH THRU SUBAREA(FEET) = 967.41 CHANNEL SLOPE = 0.0299  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.39

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.232

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	68.01	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 210.71

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.08

AVERAGE FLOW DEPTH(FEET) = 2.35 TRAVEL TIME(MIN.) = 2.65

Tc(MIN.) = 26.63

SUBAREA AREA(ACRES) = 68.01 SUBAREA RUNOFF(CFS) = 118.27

EFFECTIVE AREA(ACRES) = 148.21 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 148.2 PEAK FLOW RATE(CFS) = 257.73

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.63

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.63 FLOW VELOCITY(FEET/SEC.) = 6.43

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

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10403.00 TO NODE 10404.00 IS CODE = 56

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2433.59 DOWNSTREAM(FEET) = 2239.33  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2934.12 CHANNEL SLOPE = 0.0662  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.08

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.023

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	301.25	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 491.58

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.27

AVERAGE FLOW DEPTH(FEET) = 2.99 TRAVEL TIME(MIN.) = 4.76

Tc(MIN.) = 31.39

SUBAREA AREA(ACRES) = 301.25 SUBAREA RUNOFF(CFS) = 467.14

EFFECTIVE AREA(ACRES) = 449.46 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 449.5 PEAK FLOW RATE(CFS) = 696.97

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.59

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.59 FLOW VELOCITY(FEET/SEC.) = 11.31

LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10404.00 = 6737.56 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10404.00 TO NODE 10405.00 IS CODE = 56

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2239.33 DOWNSTREAM(FEET) = 2128.80  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2862.32 CHANNEL SLOPE = 0.0386  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.45

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.895

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	152.68	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 806.59  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.66  
 AVERAGE FLOW DEPTH(FEET) = 4.43 TRAVEL TIME(MIN.) = 4.94  
 Tc(MIN.) = 36.33  
 SUBAREA AREA(ACRES) = 152.68 SUBAREA RUNOFF(CFS) = 219.18  
 EFFECTIVE AREA(ACRES) = 602.14 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 602.1 PEAK FLOW RATE(CFS) = 864.42  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.58

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.58 FLOW VELOCITY(FEET/SEC.) = 9.85  
 LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10405.00 = 9599.88 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10405.00 TO NODE 10420.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2128.80 DOWNSTREAM(FEET) = 1759.52  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1966.12 CHANNEL SLOPE = 0.1878  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.24  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.848

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	139.70	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 961.74  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 18.03  
 AVERAGE FLOW DEPTH(FEET) = 3.24 TRAVEL TIME(MIN.) = 1.82  
 Tc(MIN.) = 38.15  
 SUBAREA AREA(ACRES) = 139.70 SUBAREA RUNOFF(CFS) = 194.63  
 EFFECTIVE AREA(ACRES) = 741.84 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 741.8 PEAK FLOW RATE(CFS) = 1033.54  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.36

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.36 FLOW VELOCITY(FEET/SEC.) = 18.40  
 LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10420.00 = 11566.00 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10405.00 TO NODE 10420.00 IS CODE = 1  
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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

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TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 38.15  
 RAINFALL INTENSITY(INCH/HR) = 1.85  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 741.84  
 TOTAL STREAM AREA(ACRES) = 741.84  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 1033.54

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10410.00 TO NODE 10411.00 IS CODE = 21  
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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

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INITIAL SUBAREA FLOW-LENGTH(FEET) = 413.10  
 ELEVATION DATA: UPSTREAM(FEET) = 3217.26 DOWNSTREAM(FEET) = 3058.86

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.517  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.814  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	-	3.06	0.30	1.000	0	9.52

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 12.43  
 TOTAL AREA(ACRES) = 3.06 PEAK FLOW RATE(CFS) = 12.43

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10411.00 TO NODE 10412.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 3058.86 DOWNSTREAM(FEET) = 2879.84  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 512.18 CHANNEL SLOPE = 0.3495  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.31  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.342

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	4.24	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.15  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.29  
 AVERAGE FLOW DEPTH(FEET) = 0.30 TRAVEL TIME(MIN.) = 1.36  
 Tc(MIN.) = 10.87  
 SUBAREA AREA(ACRES) = 4.24 SUBAREA RUNOFF(CFS) = 15.42  
 EFFECTIVE AREA(ACRES) = 7.30 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 7.3 PEAK FLOW RATE(CFS) = 26.56

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.36

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.36 FLOW VELOCITY (FEET/SEC.) = 6.97  
LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10412.00 = 925.28 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10412.00 TO NODE 10413.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 2879.84 DOWNSTREAM (FEET) = 2644.97  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1944.24 CHANNEL SLOPE = 0.1208  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.13  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.406

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 47.95 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 94.60  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.71  
AVERAGE FLOW DEPTH (FEET) = 1.02 TRAVEL TIME (MIN.) = 4.20  
Tc (MIN.) = 15.08  
SUBAREA AREA (ACRES) = 47.95 SUBAREA RUNOFF (CFS) = 134.05  
EFFECTIVE AREA (ACRES) = 55.25 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 55.2 PEAK FLOW RATE (CFS) = 154.46  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.35  
END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.35 FLOW VELOCITY (FEET/SEC.) = 8.98  
LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10413.00 = 2869.52 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10413.00 TO NODE 10414.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2644.97 DOWNSTREAM (FEET) = 2550.42  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2019.61 CHANNEL SLOPE = 0.0468  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.81  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.832

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 151.60 0.30 1.000 -

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 328.33  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.10  
AVERAGE FLOW DEPTH (FEET) = 2.65 TRAVEL TIME (MIN.) = 4.16  
Tc (MIN.) = 19.24  
SUBAREA AREA (ACRES) = 151.60 SUBAREA RUNOFF (CFS) = 345.42  
EFFECTIVE AREA (ACRES) = 206.85 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 206.9 PEAK FLOW RATE (CFS) = 471.31  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.21

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 3.21 FLOW VELOCITY (FEET/SEC.) = 8.95  
LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10414.00 = 4889.13 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10414.00 TO NODE 10415.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2550.42 DOWNSTREAM (FEET) = 2391.31  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1916.76 CHANNEL SLOPE = 0.0830  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.41  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.574

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 206.03 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 682.34  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.21  
AVERAGE FLOW DEPTH (FEET) = 3.35 TRAVEL TIME (MIN.) = 2.62  
Tc (MIN.) = 21.85  
SUBAREA AREA (ACRES) = 206.03 SUBAREA RUNOFF (CFS) = 421.71  
EFFECTIVE AREA (ACRES) = 412.88 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 412.9 PEAK FLOW RATE (CFS) = 845.11  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.74

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 3.74 FLOW VELOCITY (FEET/SEC.) = 12.95  
LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10415.00 = 6805.89 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10415.00 TO NODE 10416.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2391.31 DOWNSTREAM(FEET) = 2092.16  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2843.10 CHANNEL SLOPE = 0.1052  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.77  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.311  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 122.38 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 955.89  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.60  
 AVERAGE FLOW DEPTH(FEET) = 3.74 TRAVEL TIME(MIN.) = 3.24  
 Tc(MIN.) = 25.10  
 SUBAREA AREA(ACRES) = 122.38 SUBAREA RUNOFF(CFS) = 221.51  
 EFFECTIVE AREA(ACRES) = 535.26 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 535.3 PEAK FLOW RATE(CFS) = 968.84  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.77  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.77 FLOW VELOCITY(FEET/SEC.) = 14.64  
 LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10416.00 = 9648.99 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10416.00 TO NODE 10420.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2092.16 DOWNSTREAM(FEET) = 1759.52  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2151.95 CHANNEL SLOPE = 0.1546  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.51  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.203  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 59.94 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1020.18  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 17.10  
 AVERAGE FLOW DEPTH(FEET) = 3.51 TRAVEL TIME(MIN.) = 2.10  
 Tc(MIN.) = 27.19  
 SUBAREA AREA(ACRES) = 59.94 SUBAREA RUNOFF(CFS) = 102.68  
 EFFECTIVE AREA(ACRES) = 595.20 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 595.2 PEAK FLOW RATE(CFS) = 1019.58  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.51

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.51 FLOW VELOCITY(FEET/SEC.) = 17.09  
 LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10420.00 = 11800.94 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10416.00 TO NODE 10420.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 27.19  
 RAINFALL INTENSITY (INCH/HR) = 2.20  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 595.20  
 TOTAL STREAM AREA(ACRES) = 595.20  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 1019.58

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1033.54	38.15	1.848	0.30( 0.30)	1.00	741.8	10400.00
2	1019.58	27.19	2.203	0.30( 0.30)	1.00	595.2	10410.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1925.41	27.19	2.203	0.30( 0.30)	1.00	1124.0	10410.00
2	1862.78	38.15	1.848	0.30( 0.30)	1.00	1337.0	10400.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 1925.41 Tc(MIN.) = 27.19  
 EFFECTIVE AREA(ACRES) = 1124.00 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 1337.0  
 LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10420.00 = 11800.94 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10420.00 TO NODE 10507.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1759.52 DOWNSTREAM(FEET) = 1688.35  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2477.21 CHANNEL SLOPE = 0.0287  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 7.34  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.034  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

USER-DEFINED - 72.64 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1982.11  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.97  
 AVERAGE FLOW DEPTH (FEET) = 7.33 TRAVEL TIME (MIN.) = 3.76  
 Tc (MIN.) = 30.96  
 SUBAREA AREA (ACRES) = 72.64 SUBAREA RUNOFF (CFS) = 113.38  
 EFFECTIVE AREA (ACRES) = 1196.64 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 1409.7 PEAK FLOW RATE (CFS) = 1925.41  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 7.23

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 7.23 FLOW VELOCITY (FEET/SEC.) = 10.89  
 LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10507.00 = 14278.15 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10420.00 TO NODE 10507.00 IS CODE = 10

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

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10332.00 TO NODE 10332.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<<

PEAK FLOWRATE TABLE FILE NAME: S3.DNA  
 MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7443.85	40.87	0.30 ( 0.30)	1.00	5360.1	10200.00
2	7423.28	46.13	0.30 ( 0.30)	1.00	5921.7	10300.00
3	7414.38	46.33	0.30 ( 0.30)	1.00	5936.3	10320.00
4	7060.82	50.90	0.30 ( 0.30)	1.00	6143.3	10210.00
5	7033.11	74.83	0.30 ( 0.30)	1.00	6836.4	10100.00
TOTAL AREA (ACRES) =						6836.4

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10332.00 TO NODE 10332.00 IS CODE = 14.0

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7443.85	40.87	0.30 ( 0.30)	1.00	5360.1	10200.00
2	7423.28	46.13	0.30 ( 0.30)	1.00	5921.7	10300.00
3	7414.38	46.33	0.30 ( 0.30)	1.00	5936.3	10320.00
4	7060.82	50.90	0.30 ( 0.30)	1.00	6143.3	10210.00
5	7033.11	74.83	0.30 ( 0.30)	1.00	6836.4	10100.00
TOTAL AREA (ACRES) =						6836.4

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10332.00 TO NODE 10507.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 1739.96 DOWNSTREAM (FEET) = 1688.35  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2238.93 CHANNEL SLOPE = 0.0231  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 9.80  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.697  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	61.93	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 7482.78  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.87  
 AVERAGE FLOW DEPTH (FEET) = 9.79 TRAVEL TIME (MIN.) = 2.90  
 Tc (MIN.) = 43.77

SUBAREA AREA (ACRES) = 61.93 SUBAREA RUNOFF (CFS) = 77.86  
 EFFECTIVE AREA (ACRES) = 5422.05 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 6898.3 PEAK FLOW RATE (CFS) = 7443.85  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 9.77

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 9.77 FLOW VELOCITY (FEET/SEC.) = 12.85  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10507.00 = 35292.37 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10420.00 TO NODE 10507.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7443.85	43.77	1.697	0.30 ( 0.30)	1.00	5422.1	10200.00
2	7423.28	49.03	1.553	0.30 ( 0.30)	1.00	5983.7	10300.00
3	7414.38	49.23	1.547	0.30 ( 0.30)	1.00	5998.2	10320.00
4	7060.82	53.84	1.511	0.30 ( 0.30)	1.00	6205.2	10210.00
5	7033.11	77.78	1.375	0.30 ( 0.30)	1.00	6898.3	10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10507.00 =							35292.37 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1925.41	30.96	2.034	0.30 ( 0.30)	1.00	1196.6	10410.00
2	1862.78	41.95	1.747	0.30 ( 0.30)	1.00	1409.7	10400.00
LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10507.00 =							14278.15 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8461.75	30.96	2.034	0.30 ( 0.30)	1.00	5031.5	10410.00
2	9251.79	41.95	1.747	0.30 ( 0.30)	1.00	6606.6	10400.00
3	9242.51	43.77	1.697	0.30 ( 0.30)	1.00	6831.7	10200.00
4	9036.22	49.03	1.553	0.30 ( 0.30)	1.00	7393.3	10300.00
5	9020.18	49.23	1.547	0.30 ( 0.30)	1.00	7407.9	10320.00
6	8620.80	53.84	1.511	0.30 ( 0.30)	1.00	7614.9	10210.00
7	8417.18	77.78	1.375	0.30 ( 0.30)	1.00	8308.0	10100.00
TOTAL AREA (ACRES) =		8308.0					

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 9251.79 Tc(MIN.) = 41.950  
 EFFECTIVE AREA(ACRES) = 6606.59 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 8308.0  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10507.00 = 35292.37 FEET.

=====  
 END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 8308.0 TC(MIN.) = 41.95  
 EFFECTIVE AREA(ACRES) = 6606.59 AREA-AVERAGED Fm(INCH/HR)= 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.998  
 PEAK FLOW RATE(CFS) = 9251.79

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8461.75	30.96	2.034	0.30 ( 0.30)	1.00	5031.5	10410.00
2	9251.79	41.95	1.747	0.30 ( 0.30)	1.00	6606.6	10400.00
3	9242.51	43.77	1.697	0.30 ( 0.30)	1.00	6831.7	10200.00
4	9036.22	49.03	1.553	0.30 ( 0.30)	1.00	7393.3	10300.00
5	9020.18	49.23	1.547	0.30 ( 0.30)	1.00	7407.9	10320.00
6	8620.80	53.84	1.511	0.30 ( 0.30)	1.00	7614.9	10210.00
7	8417.18	77.78	1.375	0.30 ( 0.30)	1.00	8308.0	10100.00

=====  
 END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

-----  
FILE NAME: S5.DAT  
TIME/DATE OF STUDY: 09:57 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 7.393
- 2) 10.00; 4.538
- 3) 15.00; 3.417
- 4) 20.00; 2.726
- 5) 25.00; 2.316
- 6) 30.00; 2.059
- 7) 40.00; 1.800
- 8) 50.00; 1.526
- 9) 60.00; 1.488
- 10) 90.00; 1.297
- 11) 120.00; 1.166
- 12) 180.00; 1.004
- 13) 360.00; 0.780
- 14) 1440.00; 0.354

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*  

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10500.00 TO NODE 10501.00 IS CODE = 21  
-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 295.64  
ELEVATION DATA: UPSTREAM(FEET) = 3108.31 DOWNSTREAM(FEET) = 3060.24

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 6.565  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 6.499  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL "1 DWELLING/ACRE"	-	1.54	0.30	0.910	0	6.57

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.910  
SUBAREA RUNOFF(CFS) = 8.63  
TOTAL AREA(ACRES) = 1.54 PEAK FLOW RATE(CFS) = 8.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10501.00 TO NODE 10502.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3060.24 DOWNSTREAM(FEET) = 2942.64  
CHANNEL LENGTH THRU SUBAREA(FEET) = 690.48 CHANNEL SLOPE = 0.1703  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.49  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.324  
SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	8.27	0.30	0.943	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.943  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 27.62  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.59  
AVERAGE FLOW DEPTH(FEET) = 0.45 TRAVEL TIME(MIN.) = 2.06  
Tc(MIN.) = 8.62  
SUBAREA AREA(ACRES) = 8.27 SUBAREA RUNOFF(CFS) = 37.52  
EFFECTIVE AREA(ACRES) = 9.81 AREA-AVERAGED Fm(INCH/HR) = 0.28  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.94  
TOTAL AREA(ACRES) = 9.8 PEAK FLOW RATE(CFS) = 44.52  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.60

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.60 FLOW VELOCITY(FEET/SEC.) = 6.65  
LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10502.00 = 986.12 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10502.00 TO NODE 10503.00 IS CODE = 56



-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2942.64 DOWNSTREAM(FEET) = 2815.24  
CHANNEL LENGTH THRU SUBAREA(FEET) = 957.31 CHANNEL SLOPE = 0.1331  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.95

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.369

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.91	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 79.28

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.49

AVERAGE FLOW DEPTH(FEET) = 0.90 TRAVEL TIME(MIN.) = 2.13

Tc(MIN.) = 10.75

SUBAREA AREA(ACRES) = 18.91 SUBAREA RUNOFF(CFS) = 69.25

EFFECTIVE AREA(ACRES) = 28.72 AREA-AVERAGED Fm(INCH/HR) = 0.29

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98

TOTAL AREA(ACRES) = 28.7 PEAK FLOW RATE(CFS) = 105.34

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.06

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.06 FLOW VELOCITY(FEET/SEC.) = 8.22

LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10503.00 = 1943.43 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10503.00 TO NODE 10504.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2815.24 DOWNSTREAM(FEET) = 2202.44  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2096.20 CHANNEL SLOPE = 0.2923  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.36

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.798

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	75.49	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 224.67

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.72

AVERAGE FLOW DEPTH(FEET) = 1.30 TRAVEL TIME(MIN.) = 2.55

Tc(MIN.) = 13.30

SUBAREA AREA(ACRES) = 75.49 SUBAREA RUNOFF(CFS) = 237.65

EFFECTIVE AREA(ACRES) = 104.21 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99

TOTAL AREA(ACRES) = 104.2 PEAK FLOW RATE(CFS) = 328.23

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.61

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.61 FLOW VELOCITY(FEET/SEC.) = 15.46

LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10504.00 = 4039.63 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10504.00 TO NODE 10505.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2202.44 DOWNSTREAM(FEET) = 1969.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2800.32 CHANNEL SLOPE = 0.0834  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.55

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.125

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	278.21	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 683.89

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.24

AVERAGE FLOW DEPTH(FEET) = 3.35 TRAVEL TIME(MIN.) = 3.81

Tc(MIN.) = 17.11

SUBAREA AREA(ACRES) = 278.21 SUBAREA RUNOFF(CFS) = 707.35

EFFECTIVE AREA(ACRES) = 382.42 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 382.4 PEAK FLOW RATE(CFS) = 972.47

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.01

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 4.01 FLOW VELOCITY(FEET/SEC.) = 13.47

LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10505.00 = 6839.95 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10505.00 TO NODE 10506.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1969.00 DOWNSTREAM(FEET) = 1759.23  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2892.99 CHANNEL SLOPE = 0.0725  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.95

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.678

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	323.47	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1319.13  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.88  
 AVERAGE FLOW DEPTH(FEET) = 4.83 TRAVEL TIME(MIN.) = 3.47  
 Tc(MIN.) = 20.59  
 SUBAREA AREA(ACRES) = 323.47 SUBAREA RUNOFF(CFS) = 692.28  
 EFFECTIVE AREA(ACRES) = 705.89 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 705.9 PEAK FLOW RATE(CFS) = 1510.89  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.16

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 5.16 FLOW VELOCITY(FEET/SEC.) = 14.40  
 LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10506.00 = 9732.94 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10506.00 TO NODE 10507.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 1759.23 DOWNSTREAM(FEET) = 1688.35  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2597.28 CHANNEL SLOPE = 0.0273  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 6.98  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.335

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	212.34	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1705.50  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.35  
 AVERAGE FLOW DEPTH(FEET) = 6.92 TRAVEL TIME(MIN.) = 4.18  
 Tc(MIN.) = 24.77  
 SUBAREA AREA(ACRES) = 212.34 SUBAREA RUNOFF(CFS) = 388.90  
 EFFECTIVE AREA(ACRES) = 918.23 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 918.2 PEAK FLOW RATE(CFS) = 1681.90  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 6.87

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 6.87 FLOW VELOCITY(FEET/SEC.) = 10.31  
 LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10507.00 = 12330.22 FEET.

-----  
 END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 918.2 TC(MIN.) = 24.77  
 EFFECTIVE AREA(ACRES) = 918.23 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.999  
 PEAK FLOW RATE(CFS) = 1681.90  
 -----

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

Analysis prepared by:

-----  
FILE NAME: S6.DAT  
TIME/DATE OF STUDY: 09:57 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 7.289
- 2) 10.00; 4.486
- 3) 15.00; 3.384
- 4) 20.00; 2.705
- 5) 25.00; 2.301
- 6) 30.00; 2.047
- 7) 40.00; 1.787
- 8) 50.00; 1.517
- 9) 60.00; 1.475
- 10) 90.00; 1.283
- 11) 120.00; 1.152
- 12) 180.00; 0.989
- 13) 360.00; 0.767
- 14) 1440.00; 0.348

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	HALF- CROWN TO		STREET-CROSSFALL: IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES:			MANNING FACTOR (n)
	WIDTH (FT)	CROSSFALL (FT)			WIDTH (FT)	LIP (FT)	HIKE (FT)	
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10600.00 TO NODE 10601.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 312.13  
ELEVATION DATA: UPSTREAM(FEET) = 3250.51 DOWNSTREAM(FEET) = 3126.78

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.451  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.354  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 2.47 0.30 1.000 0 8.45  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 11.24  
TOTAL AREA(ACRES) = 2.47 PEAK FLOW RATE(CFS) = 11.24

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10601.00 TO NODE 10602.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3126.78 DOWNSTREAM(FEET) = 2951.30  
CHANNEL LENGTH THRU SUBAREA(FEET) = 620.40 CHANNEL SLOPE = 0.2828  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.38  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.462  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 6.58 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 23.60  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.23  
AVERAGE FLOW DEPTH(FEET) = 0.35 TRAVEL TIME(MIN.) = 1.66  
Tc(MIN.) = 10.11  
SUBAREA AREA(ACRES) = 6.58 SUBAREA RUNOFF(CFS) = 24.64  
EFFECTIVE AREA(ACRES) = 9.05 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 9.1 PEAK FLOW RATE(CFS) = 33.90  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.44

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.44 FLOW VELOCITY(FEET/SEC.) = 7.12  
LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10602.00 = 932.53 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10602.00 TO NODE 10603.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2951.30 DOWNSTREAM(FEET) = 2641.28  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1930.18 CHANNEL SLOPE = 0.1606  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.22  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.703

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	60.78	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 127.88

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.34

AVERAGE FLOW DEPTH(FEET) = 1.12 TRAVEL TIME(MIN.) = 3.44

Tc(MIN.) = 13.55

SUBAREA AREA(ACRES) = 60.78 SUBAREA RUNOFF(CFS) = 186.13

EFFECTIVE AREA(ACRES) = 69.83 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 69.8 PEAK FLOW RATE(CFS) = 213.84

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.50

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.50 FLOW VELOCITY(FEET/SEC.) = 10.98

LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10603.00 = 2862.71 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10603.00 TO NODE 10604.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2641.28 DOWNSTREAM(FEET) = 2318.61  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1966.90 CHANNEL SLOPE = 0.1640  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.86

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.219

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	68.78	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 304.36

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.34

AVERAGE FLOW DEPTH(FEET) = 1.81 TRAVEL TIME(MIN.) = 2.66

Tc(MIN.) = 16.21

SUBAREA AREA(ACRES) = 68.78 SUBAREA RUNOFF(CFS) = 180.72

EFFECTIVE AREA(ACRES) = 138.61 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 138.6 PEAK FLOW RATE(CFS) = 364.20

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.00

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.00 FLOW VELOCITY(FEET/SEC.) = 12.99

LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10604.00 = 4829.61 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10604.00 TO NODE 10605.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2318.61 DOWNSTREAM(FEET) = 1983.94  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2601.81 CHANNEL SLOPE = 0.1286  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.79

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.784

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	178.16	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 564.00

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.54

AVERAGE FLOW DEPTH(FEET) = 2.70 TRAVEL TIME(MIN.) = 3.20

Tc(MIN.) = 19.41

SUBAREA AREA(ACRES) = 178.16 SUBAREA RUNOFF(CFS) = 398.38

EFFECTIVE AREA(ACRES) = 316.77 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 316.8 PEAK FLOW RATE(CFS) = 708.33

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.05

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.05 FLOW VELOCITY(FEET/SEC.) = 14.44

LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10605.00 = 7431.42 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10605.00 TO NODE 10620.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1983.94 DOWNSTREAM(FEET) = 1655.24  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2439.06 CHANNEL SLOPE = 0.1348  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.16

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.534

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	61.31	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 769.98  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 15.06  
 AVERAGE FLOW DEPTH( FEET) = 3.14 TRAVEL TIME(MIN.) = 2.70  
 Tc(MIN.) = 22.11  
 SUBAREA AREA(ACRES) = 61.31 SUBAREA RUNOFF(CFS) = 123.28  
 EFFECTIVE AREA(ACRES) = 378.08 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 378.1 PEAK FLOW RATE(CFS) = 760.25  
 GIVEN CHANNEL BASE( FEET) = 10.00 CHANNEL FREEBOARD( FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT( FEET) = 3.12

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH( FEET) = 3.12 FLOW VELOCITY( FEET/SEC.) = 14.98  
 LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10620.00 = 9870.48 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10605.00 TO NODE 10620.00 IS CODE = 10  
 -----

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

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10420.00 TO NODE 10507.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S4.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8461.75	30.96	0.30( 0.30)	1.00	5031.5	10410.00
2	9251.79	41.95	0.30( 0.30)	1.00	6606.6	10400.00
3	9242.51	43.77	0.30( 0.30)	1.00	6831.7	10200.00
4	9036.22	49.03	0.30( 0.30)	1.00	7393.3	10300.00
5	9020.18	49.23	0.30( 0.30)	1.00	7407.9	10320.00
6	8620.80	53.84	0.30( 0.30)	1.00	7614.9	10210.00
7	8417.18	77.78	0.30( 0.30)	1.00	8308.0	10100.00
TOTAL AREA(ACRES) =						8308.0

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10506.00 TO NODE 10507.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S5.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1681.90	24.77	0.30( 0.30)	1.00	918.2	10500.00
TOTAL AREA(ACRES) =						918.2

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10506.00 TO NODE 10507.00 IS CODE = 14.0  
 -----

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1681.90	24.77	0.30( 0.30)	1.00	918.2	10500.00
TOTAL AREA(ACRES) =						918.2

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10420.00 TO NODE 10507.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1681.90	24.77	2.320	0.30( 0.30)	1.00	918.2	10500.00
LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10507.00 = 12330.22 FEET.							

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8461.75	30.96	2.022	0.30( 0.30)	1.00	5031.5	10410.00
2	9251.79	41.95	1.734	0.30( 0.30)	1.00	6606.6	10400.00
3	9242.51	43.77	1.685	0.30( 0.30)	1.00	6831.7	10200.00
4	9036.22	49.03	1.543	0.30( 0.30)	1.00	7393.3	10300.00
5	9020.18	49.23	1.538	0.30( 0.30)	1.00	7407.9	10320.00
6	8620.80	53.84	1.501	0.30( 0.30)	1.00	7614.9	10210.00
7	8417.18	77.78	1.361	0.30( 0.30)	1.00	8308.0	10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10507.00 = 35292.37 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9621.81	24.77	2.320	0.30( 0.30)	1.00	4944.2	10500.00
2	9895.93	30.96	2.022	0.30( 0.30)	1.00	5949.7	10410.00
3	10446.32	41.95	1.734	0.30( 0.30)	1.00	7524.8	10400.00
4	10396.19	43.77	1.685	0.30( 0.30)	1.00	7750.0	10200.00
5	10071.55	49.03	1.543	0.30( 0.30)	1.00	8311.6	10300.00
6	10050.98	49.23	1.538	0.30( 0.30)	1.00	8326.1	10320.00
7	9620.93	53.84	1.501	0.30( 0.30)	1.00	8533.1	10210.00
8	9301.02	77.78	1.361	0.30( 0.30)	1.00	9226.2	10100.00
TOTAL AREA(ACRES) =						9226.2	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 10446.32 Tc(MIN.) = 41.950  
 EFFECTIVE AREA(ACRES) = 7524.82 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 9226.2  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10507.00 = 35292.37 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10507.00 TO NODE 10620.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1688.35 DOWNSTREAM(FEET) = 1655.24  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2570.61 CHANNEL SLOPE = 0.0129  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 13.26  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.632

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 83.74 0.30 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10496.53  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.36  
 AVERAGE FLOW DEPTH(FEET) = 13.25 TRAVEL TIME(MIN.) = 3.77  
 Tc(MIN.) = 45.72  
 SUBAREA AREA(ACRES) = 83.74 SUBAREA RUNOFF(CFS) = 100.43  
 EFFECTIVE AREA(ACRES) = 7608.56 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 9310.0 PEAK FLOW RATE(CFS) = 10446.32  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 13.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 13.22 FLOW VELOCITY(FEET/SEC.) = 11.35  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10620.00 = 37862.98 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10605.00 TO NODE 10620.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<  
 =====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9621.81	28.62	2.117	0.30( 0.30)	1.00	5027.9	10500.00
2	9895.93	34.78	1.923	0.30( 0.30)	1.00	6033.5	10410.00
3	10446.32	45.72	1.632	0.30( 0.30)	1.00	7608.6	10400.00
4	10396.19	47.54	1.583	0.30( 0.30)	1.00	7833.7	10200.00
5	10071.55	52.84	1.505	0.30( 0.30)	1.00	8395.3	10300.00
6	10050.98	53.05	1.504	0.30( 0.30)	1.00	8409.9	10320.00
7	9620.93	57.70	1.485	0.30( 0.30)	1.00	8616.8	10210.00
8	9301.02	81.67	1.336	0.30( 0.30)	1.00	9310.0	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10620.00 = 37862.98 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	760.25	22.11	2.534	0.30( 0.30)	1.00	378.1	10600.00

LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10620.00 = 9870.48 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9900.79	22.11	2.534	0.30( 0.30)	1.00	4262.9	10600.00

2	10240.13	28.62	2.117	0.30( 0.30)	1.00	5406.0	10500.00
3	10448.11	34.78	1.923	0.30( 0.30)	1.00	6411.6	10410.00
4	10899.75	45.72	1.632	0.30( 0.30)	1.00	7986.6	10400.00
5	10832.88	47.54	1.583	0.30( 0.30)	1.00	8211.8	10200.00
6	10481.63	52.84	1.505	0.30( 0.30)	1.00	8773.4	10300.00
7	10460.76	53.05	1.504	0.30( 0.30)	1.00	8787.9	10320.00
8	10024.06	57.70	1.485	0.30( 0.30)	1.00	8994.9	10210.00
9	9653.67	81.67	1.336	0.30( 0.30)	1.00	9688.1	10100.00

TOTAL AREA(ACRES) = 9688.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 10899.75 Tc(MIN.) = 45.722  
 EFFECTIVE AREA(ACRES) = 7986.64 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 9688.1  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10620.00 = 37862.98 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10620.00 TO NODE 10621.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 1655.24 DOWNSTREAM(FEET) = 1584.84  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2294.47 CHANNEL SLOPE = 0.0307  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 11.08  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.567

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 342.43 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11095.08  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.87  
 AVERAGE FLOW DEPTH(FEET) = 11.07 TRAVEL TIME(MIN.) = 2.41  
 Tc(MIN.) = 48.13  
 SUBAREA AREA(ACRES) = 342.43 SUBAREA RUNOFF(CFS) = 390.62  
 EFFECTIVE AREA(ACRES) = 8329.07 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 10030.5 PEAK FLOW RATE(CFS) = 10899.75  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 10.97

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 10.97 FLOW VELOCITY(FEET/SEC.) = 15.80  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10621.00 = 40157.45 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10621.00 TO NODE 10640.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 1584.84 DOWNSTREAM(FEET) = 1443.87  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2923.79 CHANNEL SLOPE = 0.0482  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 9.88  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.514  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 160.90 0.30 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10987.65  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 18.68  
 AVERAGE FLOW DEPTH(FEET) = 9.87 TRAVEL TIME(MIN.) = 2.61  
 Tc(MIN.) = 50.74  
 SUBAREA AREA(ACRES) = 160.90 SUBAREA RUNOFF(CFS) = 175.79  
 EFFECTIVE AREA(ACRES) = 8489.97 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 10191.4 PEAK FLOW RATE(CFS) = 10899.75  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 9.83

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 9.83 FLOW VELOCITY(FEET/SEC.) = 18.64  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10640.00 = 43081.24 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10621.00 TO NODE 10640.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

-----  
 TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 50.74  
 RAINFALL INTENSITY(INCH/HR) = 1.51  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 8489.97  
 TOTAL STREAM AREA(ACRES) = 10191.39  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 10899.75

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10630.00 TO NODE 10631.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 298.79  
 ELEVATION DATA: UPSTREAM(FEET) = 3257.00 DOWNSTREAM(FEET) = 3147.13

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.430  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.366  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
 NATURAL FAIR COVER  
 "CHAPARRAL,BROADLEAF" - 1.25 0.30 1.000 0 8.43  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 5.70  
 TOTAL AREA(ACRES) = 1.25 PEAK FLOW RATE(CFS) = 5.70

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10631.00 TO NODE 10632.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 3147.13 DOWNSTREAM(FEET) = 2774.29  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 640.96 CHANNEL SLOPE = 0.5817  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.23  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 4.469  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 4.75 0.30 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14.65  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.49  
 AVERAGE FLOW DEPTH(FEET) = 0.22 TRAVEL TIME(MIN.) = 1.65  
 Tc(MIN.) = 10.08  
 SUBAREA AREA(ACRES) = 4.75 SUBAREA RUNOFF(CFS) = 17.82  
 EFFECTIVE AREA(ACRES) = 6.00 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 6.0 PEAK FLOW RATE(CFS) = 22.51  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.28

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.28 FLOW VELOCITY(FEET/SEC.) = 7.69  
 LONGEST FLOWPATH FROM NODE 10630.00 TO NODE 10632.00 = 939.75 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10632.00 TO NODE 10633.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 2774.29 DOWNSTREAM(FEET) = 2004.58  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1905.65 CHANNEL SLOPE = 0.4039  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.02  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.952  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

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USER-DEFINED          -      79.75      0.30      1.000      -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 154.22
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 13.53
AVERAGE FLOW DEPTH (FEET) = 0.96 TRAVEL TIME (MIN.) = 2.35
Tc (MIN.) = 12.42
SUBAREA AREA (ACRES) = 79.75 SUBAREA RUNOFF (CFS) = 262.11
EFFECTIVE AREA (ACRES) = 85.75 AREA-AVERAGED Fm (INCH/HR) = 0.30
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA (ACRES) = 85.8 PEAK FLOW RATE (CFS) = 281.83
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT (FEET) = 1.35

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH (FEET) = 1.35 FLOW VELOCITY (FEET/SEC.) = 16.47
LONGEST FLOWPATH FROM NODE 10630.00 TO NODE 10633.00 = 2845.40 FEET.

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*****
FLOW PROCESS FROM NODE 10633.00 TO NODE 10634.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 2004.58 DOWNSTREAM (FEET) = 1714.99
CHANNEL LENGTH THRU SUBAREA (FEET) = 1868.05 CHANNEL SLOPE = 0.1550
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT (FEET) = 2.38
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.449
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS
LAND USE              GROUP   (ACRES)  (INCH/HR) (DECIMAL) CN
USER-DEFINED          -      124.45    0.30    1.000    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 458.64
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 13.65
AVERAGE FLOW DEPTH (FEET) = 2.30 TRAVEL TIME (MIN.) = 2.28
Tc (MIN.) = 14.71
SUBAREA AREA (ACRES) = 124.45 SUBAREA RUNOFF (CFS) = 352.71
EFFECTIVE AREA (ACRES) = 210.20 AREA-AVERAGED Fm (INCH/HR) = 0.30
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA (ACRES) = 210.2 PEAK FLOW RATE (CFS) = 595.73
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT (FEET) = 2.64

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH (FEET) = 2.64 FLOW VELOCITY (FEET/SEC.) = 14.73
LONGEST FLOWPATH FROM NODE 10630.00 TO NODE 10634.00 = 4713.45 FEET.

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*****
FLOW PROCESS FROM NODE 10634.00 TO NODE 10640.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

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=====
ELEVATION DATA: UPSTREAM (FEET) = 1714.99 DOWNSTREAM (FEET) = 1443.87
CHANNEL LENGTH THRU SUBAREA (FEET) = 1685.34 CHANNEL SLOPE = 0.1609
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT (FEET) = 2.76
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.175
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS
LAND USE              GROUP   (ACRES)  (INCH/HR) (DECIMAL) CN
USER-DEFINED          -      42.00    0.30    1.000    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 650.07
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 15.30
AVERAGE FLOW DEPTH (FEET) = 2.74 TRAVEL TIME (MIN.) = 1.84
Tc (MIN.) = 16.54
SUBAREA AREA (ACRES) = 42.00 SUBAREA RUNOFF (CFS) = 108.67
EFFECTIVE AREA (ACRES) = 252.20 AREA-AVERAGED Fm (INCH/HR) = 0.30
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA (ACRES) = 252.2 PEAK FLOW RATE (CFS) = 652.51
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT (FEET) = 2.75

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH (FEET) = 2.75 FLOW VELOCITY (FEET/SEC.) = 15.30
LONGEST FLOWPATH FROM NODE 10630.00 TO NODE 10640.00 = 6398.79 FEET.

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*****
FLOW PROCESS FROM NODE 10634.00 TO NODE 10640.00 IS CODE = 1
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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

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=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION (MIN.) = 16.54
RAINFALL INTENSITY (INCH/HR) = 3.17
AREA-AVERAGED Fm (INCH/HR) = 0.30
AREA-AVERAGED Fp (INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA (ACRES) = 252.20
TOTAL STREAM AREA (ACRES) = 252.20
PEAK FLOW RATE (CFS) AT CONFLUENCE = 652.51

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** CONFLUENCE DATA **

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STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9900.79	27.25	2.187	0.30 ( 0.30)	1.00	4766.3	10600.00
1	10240.13	33.72	1.950	0.30 ( 0.30)	1.00	5909.3	10500.00
1	10448.11	39.85	1.791	0.30 ( 0.30)	1.00	6914.9	10410.00
1	10899.75	50.74	1.514	0.30 ( 0.30)	1.00	8490.0	10400.00
1	10832.88	52.57	1.506	0.30 ( 0.30)	1.00	8715.1	10200.00
1	10481.63	57.91	1.484	0.30 ( 0.30)	1.00	9276.7	10300.00
1	10460.76	58.12	1.483	0.30 ( 0.30)	1.00	9291.3	10320.00
1	10024.06	62.83	1.457	0.30 ( 0.30)	1.00	9498.3	10210.00
1	9653.67	86.86	1.303	0.30 ( 0.30)	1.00	10191.4	10100.00



2 652.51 16.54 3.175 0.30( 0.30) 1.00 252.2 10630.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9808.97	16.54	3.175	0.30( 0.30)	1.00	3145.3	10630.00
2	10329.04	27.25	2.187	0.30( 0.30)	1.00	5018.5	10600.00
3	10614.75	33.72	1.950	0.30( 0.30)	1.00	6161.5	10500.00
4	10786.51	39.85	1.791	0.30( 0.30)	1.00	7167.1	10410.00
5	11175.30	50.74	1.514	0.30( 0.30)	1.00	8742.2	10400.00
6	11106.67	52.57	1.506	0.30( 0.30)	1.00	8967.3	10200.00
7	10750.34	57.91	1.484	0.30( 0.30)	1.00	9528.9	10300.00
8	10729.27	58.12	1.483	0.30( 0.30)	1.00	9543.5	10320.00
9	10286.67	62.83	1.457	0.30( 0.30)	1.00	9750.5	10210.00
10	9881.37	86.86	1.303	0.30( 0.30)	1.00	10443.6	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 11175.30 Tc (MIN.) = 50.74  
EFFECTIVE AREA(ACRES) = 8742.17 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 10443.6  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10640.00 = 43081.24 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10640.00 TO NODE 10724.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1443.87 DOWNSTREAM(FEET) = 1320.32  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2254.45 CHANNEL SLOPE = 0.0548  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 9.67  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.506  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	94.37	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11226.51  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 19.69  
AVERAGE FLOW DEPTH(FEET) = 9.66 TRAVEL TIME(MIN.) = 1.91  
Tc(MIN.) = 52.65  
SUBAREA AREA(ACRES) = 94.37 SUBAREA RUNOFF(CFS) = 102.42  
EFFECTIVE AREA(ACRES) = 8836.54 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 10538.0 PEAK FLOW RATE(CFS) = 11175.30  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 9.64

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 9.64 FLOW VELOCITY(FEET/SEC.) = 19.67  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10724.00 = 45335.69 FEET.

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 10538.0 TC(MIN.) = 52.65  
EFFECTIVE AREA(ACRES) = 8836.54 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.999  
PEAK FLOW RATE(CFS) = 11175.30

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9808.97	18.51	2.907	0.30( 0.30)	1.00	3239.7	10630.00
2	10329.04	29.20	2.088	0.30( 0.30)	1.00	5112.8	10600.00
3	10614.75	35.65	1.900	0.30( 0.30)	1.00	6255.9	10500.00
4	10786.51	41.78	1.739	0.30( 0.30)	1.00	7261.5	10410.00
5	11175.30	52.65	1.506	0.30( 0.30)	1.00	8836.5	10400.00
6	11106.67	54.48	1.498	0.30( 0.30)	1.00	9061.7	10200.00
7	10750.34	59.84	1.476	0.30( 0.30)	1.00	9623.3	10300.00
8	10729.27	60.05	1.475	0.30( 0.30)	1.00	9637.8	10320.00
9	10286.67	64.78	1.444	0.30( 0.30)	1.00	9844.8	10210.00
10	9881.37	88.83	1.290	0.30( 0.30)	1.00	10538.0	10100.00

=====  
END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*

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

Analysis prepared by:

-----  
FILE NAME: S7.DAT  
TIME/DATE OF STUDY: 09:57 04/01/2013  
=====

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--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

=====

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*

NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 7.289
- 2) 10.00; 4.486
- 3) 15.00; 3.384
- 4) 20.00; 2.705
- 5) 25.00; 2.301
- 6) 30.00; 2.047
- 7) 40.00; 1.787
- 8) 50.00; 1.517
- 9) 60.00; 1.475
- 10) 90.00; 1.283
- 11) 120.00; 1.152
- 12) 180.00; 0.989
- 13) 360.00; 0.767
- 14) 1440.00; 0.348

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	HALF- CROWN TO		STREET-CROSSFALL: IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES:			MANNING FACTOR (n)
	WIDTH (FT)	CROSSFALL (FT)			WIDTH (FT)	LIP (FT)	HIKE (FT)	
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 10700.00 TO NODE 10701.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 281.18  
ELEVATION DATA: UPSTREAM(FEET) = 3512.68 DOWNSTREAM(FEET) = 3444.33

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.938  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.081  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	-	1.30	0.30	1.000	0	8.94

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 5.59  
 TOTAL AREA(ACRES) = 1.30 PEAK FLOW RATE(CFS) = 5.59

\*\*\*\*\*

FLOW PROCESS FROM NODE 10701.00 TO NODE 10702.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3444.33 DOWNSTREAM(FEET) = 3246.68  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 700.05 CHANNEL SLOPE = 0.2823  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.32  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.257  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	6.49	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 17.21  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.55  
 AVERAGE FLOW DEPTH(FEET) = 0.29 TRAVEL TIME(MIN.) = 2.10  
 Tc(MIN.) = 11.04  
 SUBAREA AREA(ACRES) = 6.49 SUBAREA RUNOFF(CFS) = 23.11  
 EFFECTIVE AREA(ACRES) = 7.79 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 7.8 PEAK FLOW RATE(CFS) = 27.74  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.39

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.39 FLOW VELOCITY(FEET/SEC.) = 6.67  
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10702.00 = 981.23 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10702.00 TO NODE 10703.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3246.68 DOWNSTREAM(FEET) = 3075.14  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1893.56 CHANNEL SLOPE = 0.0906  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.04

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.244

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	31.98	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 70.71

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.32

AVERAGE FLOW DEPTH(FEET) = 0.94 TRAVEL TIME(MIN.) = 4.99

Tc(MIN.) = 16.03

SUBAREA AREA(ACRES) = 31.98 SUBAREA RUNOFF(CFS) = 84.74

EFFECTIVE AREA(ACRES) = 39.77 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 39.8 PEAK FLOW RATE(CFS) = 105.38

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.18

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.18 FLOW VELOCITY(FEET/SEC.) = 7.23

LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10703.00 = 2874.79 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10703.00 TO NODE 10703.50 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3075.14 DOWNSTREAM(FEET) = 2952.03  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2060.61 CHANNEL SLOPE = 0.0597  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.63

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.624

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	34.58	0.30	0.872	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.872

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 142.23

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.90

AVERAGE FLOW DEPTH(FEET) = 1.57 TRAVEL TIME(MIN.) = 4.98

Tc(MIN.) = 21.01

SUBAREA AREA(ACRES) = 34.58 SUBAREA RUNOFF(CFS) = 73.51

EFFECTIVE AREA(ACRES) = 74.35 AREA-AVERAGED Fm(INCH/HR) = 0.28

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.94

TOTAL AREA(ACRES) = 74.4 PEAK FLOW RATE(CFS) = 156.69

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.66

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.66 FLOW VELOCITY(FEET/SEC.) = 7.09

LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10703.50 = 4935.40 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10703.50 TO NODE 10704.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2952.03 DOWNSTREAM(FEET) = 2895.59  
CHANNEL LENGTH THRU SUBAREA(FEET) = 930.70 CHANNEL SLOPE = 0.0606  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.83

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.457

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	30.69	0.30	0.951	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.951

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 186.68

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.52

AVERAGE FLOW DEPTH(FEET) = 1.82 TRAVEL TIME(MIN.) = 2.06

Tc(MIN.) = 23.07

SUBAREA AREA(ACRES) = 30.69 SUBAREA RUNOFF(CFS) = 59.98

EFFECTIVE AREA(ACRES) = 105.04 AREA-AVERAGED Fm(INCH/HR) = 0.28

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.94

TOTAL AREA(ACRES) = 105.0 PEAK FLOW RATE(CFS) = 205.51

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.92

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.92 FLOW VELOCITY(FEET/SEC.) = 7.74

LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10704.00 = 5866.10 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10704.00 TO NODE 10720.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2895.59 DOWNSTREAM(FEET) = 2581.07  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2585.44 CHANNEL SLOPE = 0.1217  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.28

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.214

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	199.40	0.30	0.977	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.977  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 378.17  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.83  
 AVERAGE FLOW DEPTH(FEET) = 2.22 TRAVEL TIME(MIN.) = 3.64  
 Tc(MIN.) = 26.71  
 SUBAREA AREA(ACRES) = 199.40 SUBAREA RUNOFF(CFS) = 344.73  
 EFFECTIVE AREA(ACRES) = 304.44 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 304.4 PEAK FLOW RATE(CFS) = 527.27  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.64

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.64 FLOW VELOCITY(FEET/SEC.) = 13.04  
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10720.00 = 8451.54 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10704.00 TO NODE 10720.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

-----  
 TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 26.71  
 RAINFALL INTENSITY(INCH/HR) = 2.21  
 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.97  
 EFFECTIVE STREAM AREA(ACRES) = 304.44  
 TOTAL STREAM AREA(ACRES) = 304.44  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 527.27

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10710.00 TO NODE 10711.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 943.64  
 ELEVATION DATA: UPSTREAM(FEET) = 3389.13 DOWNSTREAM(FEET) = 3276.30

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.438  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.169  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
PUBLIC PARK	-	7.76	0.30	0.981	0	11.44

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.981  
 SUBAREA RUNOFF(CFS) = 27.06  
 TOTAL AREA(ACRES) = 7.76 PEAK FLOW RATE(CFS) = 27.06

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10711.00 TO NODE 10712.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 3276.30 DOWNSTREAM(FEET) = 3152.26  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 950.69 CHANNEL SLOPE = 0.1305  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.81  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.657

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	22.39	0.30	0.988	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.988  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 61.06  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.82  
 AVERAGE FLOW DEPTH(FEET) = 0.78 TRAVEL TIME(MIN.) = 2.32  
 Tc(MIN.) = 13.76

SUBAREA AREA(ACRES) = 22.39 SUBAREA RUNOFF(CFS) = 67.72  
 EFFECTIVE AREA(ACRES) = 30.15 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 30.1 PEAK FLOW RATE(CFS) = 91.20  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.98

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.98 FLOW VELOCITY(FEET/SEC.) = 7.79  
 LONGEST FLOWPATH FROM NODE 10710.00 TO NODE 10712.00 = 1894.33 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10712.00 TO NODE 10713.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 3152.26 DOWNSTREAM(FEET) = 2879.03  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1909.77 CHANNEL SLOPE = 0.1431  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.29  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.090

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	42.59	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 144.88  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.36  
 AVERAGE FLOW DEPTH(FEET) = 1.24 TRAVEL TIME(MIN.) = 3.40  
 Tc(MIN.) = 17.16

SUBAREA AREA(ACRES) = 42.59 SUBAREA RUNOFF(CFS) = 106.95  
 EFFECTIVE AREA(ACRES) = 72.74 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 72.7 PEAK FLOW RATE(CFS) = 182.77  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.42  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.42 FLOW VELOCITY(FEET/SEC.) = 10.06  
 LONGEST FLOWPATH FROM NODE 10710.00 TO NODE 10713.00 = 3804.10 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10713.00 TO NODE 10720.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2879.03 DOWNSTREAM(FEET) = 2581.07  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2621.96 CHANNEL SLOPE = 0.1136  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.26  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.620  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	156.72	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 347.01  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.26  
 AVERAGE FLOW DEPTH(FEET) = 2.15 TRAVEL TIME(MIN.) = 3.88  
 Tc(MIN.) = 21.05  
 SUBAREA AREA(ACRES) = 156.72 SUBAREA RUNOFF(CFS) = 327.31  
 EFFECTIVE AREA(ACRES) = 229.46 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 229.5 PEAK FLOW RATE(CFS) = 479.34  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.56

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.56 FLOW VELOCITY(FEET/SEC.) = 12.38  
 LONGEST FLOWPATH FROM NODE 10710.00 TO NODE 10720.00 = 6426.06 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10713.00 TO NODE 10720.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 21.05  
 RAINFALL INTENSITY(INCH/HR) = 2.62  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 229.46  
 TOTAL STREAM AREA(ACRES) = 229.46  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 479.34

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	527.27	26.71	2.214	0.30( 0.29)	0.97	304.4	10700.00
2	479.34	21.05	2.620	0.30( 0.30)	1.00	229.5	10710.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	982.50	21.05	2.620	0.30( 0.29)	0.98	469.3	10710.00
2	922.66	26.71	2.214	0.30( 0.29)	0.98	533.9	10700.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 982.50 Tc(MIN.) = 21.05  
 EFFECTIVE AREA(ACRES) = 469.31 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98  
 TOTAL AREA(ACRES) = 533.9  
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10720.00 = 8451.54 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10720.00 TO NODE 10720.50 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2581.07 DOWNSTREAM(FEET) = 2523.48  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1699.13 CHANNEL SLOPE = 0.0339  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.34  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.391  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	116.31	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1092.00  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.99  
 AVERAGE FLOW DEPTH(FEET) = 5.31 TRAVEL TIME(MIN.) = 2.84  
 Tc(MIN.) = 23.88  
 SUBAREA AREA(ACRES) = 116.31 SUBAREA RUNOFF(CFS) = 218.93  
 EFFECTIVE AREA(ACRES) = 585.62 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 650.2 PEAK FLOW RATE(CFS) = 1104.66  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.34

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 5.34 FLOW VELOCITY(FEET/SEC.) = 10.02  
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10720.50 = 10150.67 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10720.50 TO NODE 10721.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2523.48 DOWNSTREAM(FEET) = 2488.66  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1575.08 CHANNEL SLOPE = 0.0221  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.11

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.204

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	82.28	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1175.18

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.70

AVERAGE FLOW DEPTH(FEET) = 6.09 TRAVEL TIME(MIN.) = 3.02

Tc(MIN.) = 26.90

SUBAREA AREA(ACRES) = 82.28 SUBAREA RUNOFF(CFS) = 141.04

EFFECTIVE AREA(ACRES) = 667.90 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99

TOTAL AREA(ACRES) = 732.5 PEAK FLOW RATE(CFS) = 1147.20

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.02

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 6.02 FLOW VELOCITY(FEET/SEC.) = 8.64

LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10721.00 = 11725.75 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10721.00 TO NODE 10721.50 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2488.66 DOWNSTREAM(FEET) = 2453.35  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2032.11 CHANNEL SLOPE = 0.0174  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.93

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.021

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	259.52	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1348.22

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.24

AVERAGE FLOW DEPTH(FEET) = 6.88 TRAVEL TIME(MIN.) = 4.11

Tc(MIN.) = 31.01

SUBAREA AREA(ACRES) = 259.52 SUBAREA RUNOFF(CFS) = 401.92

EFFECTIVE AREA(ACRES) = 927.42 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99

TOTAL AREA(ACRES) = 992.0 PEAK FLOW RATE(CFS) = 1438.66

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.10

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 7.10 FLOW VELOCITY(FEET/SEC.) = 8.38

LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10721.50 = 13757.86 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10721.50 TO NODE 10722.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2453.35 DOWNSTREAM(FEET) = 2384.52  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1842.37 CHANNEL SLOPE = 0.0374  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.26

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.951

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	229.78	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1609.39

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.46

AVERAGE FLOW DEPTH(FEET) = 6.25 TRAVEL TIME(MIN.) = 2.68

Tc(MIN.) = 33.69

SUBAREA AREA(ACRES) = 229.78 SUBAREA RUNOFF(CFS) = 341.45

EFFECTIVE AREA(ACRES) = 1157.20 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99

TOTAL AREA(ACRES) = 1221.8 PEAK FLOW RATE(CFS) = 1721.95

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.45

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 6.45 FLOW VELOCITY(FEET/SEC.) = 11.66

LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10722.00 = 15600.23 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10722.00 TO NODE 10723.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2384.52 DOWNSTREAM(FEET) = 1925.64  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3780.37 CHANNEL SLOPE = 0.1214  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.16

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.863

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	308.58	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1939.00  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 18.57  
 AVERAGE FLOW DEPTH(FEET) = 5.15 TRAVEL TIME(MIN.) = 3.39  
 Tc(MIN.) = 37.08  
 SUBAREA AREA(ACRES) = 308.58 SUBAREA RUNOFF(CFS) = 434.05  
 EFFECTIVE AREA(ACRES) = 1465.78 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 1530.4 PEAK FLOW RATE(CFS) = 2064.15  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.30

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 5.30 FLOW VELOCITY(FEET/SEC.) = 18.91  
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10723.00 = 19380.60 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10723.00 TO NODE 10724.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 1925.64 DOWNSTREAM(FEET) = 1320.32  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 3826.73 CHANNEL SLOPE = 0.1582  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.31  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.786

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	434.11	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2354.47  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 21.57  
 AVERAGE FLOW DEPTH(FEET) = 5.30 TRAVEL TIME(MIN.) = 2.96  
 Tc(MIN.) = 40.04  
 SUBAREA AREA(ACRES) = 434.11 SUBAREA RUNOFF(CFS) = 580.57  
 EFFECTIVE AREA(ACRES) = 1899.89 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 1964.5 PEAK FLOW RATE(CFS) = 2543.24  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.50

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 5.50 FLOW VELOCITY(FEET/SEC.) = 22.00  
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10724.00 = 23207.33 FEET.

-----  
 END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 1964.5 TC(MIN.) = 40.04  
 EFFECTIVE AREA(ACRES) = 1899.89 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.995  
 PEAK FLOW RATE(CFS) = 2543.24

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2543.24	40.04	1.786	0.30( 0.30)	1.00	1899.9	10710.00
2	2346.69	45.98	1.626	0.30( 0.30)	0.99	1964.5	10700.00

=====  
 END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*

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

Analysis prepared by:

-----  
FILE NAME: S8.DAT  
TIME/DATE OF STUDY: 09:57 04/01/2013  
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-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 7.056
- 2) 10.00; 4.371
- 3) 15.00; 3.309
- 4) 20.00; 2.658
- 5) 25.00; 2.267
- 6) 30.00; 2.018
- 7) 40.00; 1.759
- 8) 50.00; 1.498
- 9) 60.00; 1.444
- 10) 90.00; 1.251
- 11) 120.00; 1.119
- 12) 180.00; 0.957
- 13) 360.00; 0.738
- 14) 1440.00; 0.333

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10800.00 TO NODE 10801.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 248.93  
ELEVATION DATA: UPSTREAM(FEET) = 2617.19 DOWNSTREAM(FEET) = 2506.15

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.540  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.692  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	-	0.83	0.30	1.000	0	7.54

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 4.03  
TOTAL AREA(ACRES) = 0.83 PEAK FLOW RATE(CFS) = 4.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10801.00 TO NODE 10802.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2506.15 DOWNSTREAM(FEET) = 2237.54  
CHANNEL LENGTH THRU SUBAREA(FEET) = 677.01 CHANNEL SLOPE = 0.3968  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.26  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.646  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	5.30	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14.53  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.79  
AVERAGE FLOW DEPTH(FEET) = 0.24 TRAVEL TIME(MIN.) = 1.95  
Tc(MIN.) = 9.49  
SUBAREA AREA(ACRES) = 5.30 SUBAREA RUNOFF(CFS) = 20.73  
EFFECTIVE AREA(ACRES) = 6.13 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 6.1 PEAK FLOW RATE(CFS) = 23.98  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.32 FLOW VELOCITY(FEET/SEC.) = 6.97  
LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10802.00 = 925.94 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10802.00 TO NODE 10803.00 IS CODE = 56  
=====



-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2237.54 DOWNSTREAM(FEET) = 1920.11  
CHANNEL LENGTH THRU SUBAREA(FEET) = 954.74 CHANNEL SLOPE = 0.3325  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.58

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.103

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.25	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 55.28

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.98

AVERAGE FLOW DEPTH(FEET) = 0.55 TRAVEL TIME(MIN.) = 1.77

Tc(MIN.) = 11.26

SUBAREA AREA(ACRES) = 18.25 SUBAREA RUNOFF(CFS) = 62.47

EFFECTIVE AREA(ACRES) = 24.38 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 24.4 PEAK FLOW RATE(CFS) = 83.46

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.71

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.71 FLOW VELOCITY(FEET/SEC.) = 10.35

LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10803.00 = 1880.68 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10803.00 TO NODE 10820.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1920.11 DOWNSTREAM(FEET) = 1289.38  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2201.18 CHANNEL SLOPE = 0.2865  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.29

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.508

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	78.99	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 198.16

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.08

AVERAGE FLOW DEPTH(FEET) = 1.22 TRAVEL TIME(MIN.) = 2.80

Tc(MIN.) = 14.06

SUBAREA AREA(ACRES) = 78.99 SUBAREA RUNOFF(CFS) = 228.06

EFFECTIVE AREA(ACRES) = 103.37 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 103.4 PEAK FLOW RATE(CFS) = 298.45

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.54

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.54 FLOW VELOCITY(FEET/SEC.) = 14.86

LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10820.00 = 4081.86 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10803.00 TO NODE 10820.00 IS CODE = 10  
-----

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

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10640.00 TO NODE 10724.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<

=====

PEAK FLOWRATE TABLE FILE NAME: S6.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9808.97	18.51	0.30( 0.30)	1.00	3239.7	10630.00
2	10329.04	29.20	0.30( 0.30)	1.00	5112.8	10600.00
3	10614.75	35.65	0.30( 0.30)	1.00	6255.9	10500.00
4	10786.51	41.78	0.30( 0.30)	1.00	7261.5	10410.00
5	11175.30	52.65	0.30( 0.30)	1.00	8836.5	10400.00
6	11106.67	54.48	0.30( 0.30)	1.00	9061.7	10200.00
7	10750.34	59.84	0.30( 0.30)	1.00	9623.3	10300.00
8	10729.27	60.05	0.30( 0.30)	1.00	9637.8	10320.00
9	10286.67	64.78	0.30( 0.30)	1.00	9844.8	10210.00
10	9881.37	88.83	0.30( 0.30)	1.00	10538.0	10100.00

TOTAL AREA(ACRES) = 10538.0

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10723.00 TO NODE 10724.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 3 <<<<

=====

PEAK FLOWRATE TABLE FILE NAME: S7.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2543.24	40.04	0.30( 0.30)	1.00	1899.9	10710.00
2	2346.69	45.98	0.30( 0.30)	0.99	1964.5	10700.00

TOTAL AREA(ACRES) = 1964.5

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10723.00 TO NODE 10724.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<

=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2543.24	40.04	0.30( 0.30)	1.00	1899.9	10710.00

2 2346.69 45.98 0.30( 0.30) 0.99 1964.5 10700.00  
TOTAL AREA (ACRES) = 1964.5

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10640.00 TO NODE 10724.00 IS CODE = 11  
-----

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<  
-----

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2543.24	40.04	1.758	0.30( 0.30)	1.00	1899.9	10710.00
2	2346.69	45.98	1.603	0.30( 0.30)	0.99	1964.5	10700.00

LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10724.00 = 23207.33 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9808.97	18.51	2.852	0.30( 0.30)	1.00	3239.7	10630.00
2	10329.04	29.20	2.058	0.30( 0.30)	1.00	5112.8	10600.00
3	10614.75	35.65	1.872	0.30( 0.30)	1.00	6255.9	10500.00
4	10786.51	41.78	1.713	0.30( 0.30)	1.00	7261.5	10410.00
5	11175.30	52.65	1.484	0.30( 0.30)	1.00	8836.5	10400.00
6	11106.67	54.48	1.474	0.30( 0.30)	1.00	9061.7	10200.00
7	10750.34	59.84	1.445	0.30( 0.30)	1.00	9623.3	10300.00
8	10729.27	60.05	1.444	0.30( 0.30)	1.00	9637.8	10320.00
9	10286.67	64.78	1.413	0.30( 0.30)	1.00	9844.8	10210.00
10	9881.37	88.83	1.259	0.30( 0.30)	1.00	10538.0	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10724.00 = 45335.69 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11866.07	18.51	2.852	0.30( 0.30)	1.00	4118.2	10630.00
2	12564.84	29.20	2.058	0.30( 0.30)	1.00	6498.3	10600.00
3	13055.59	35.65	1.872	0.30( 0.30)	1.00	7947.5	10500.00
4	13281.02	40.04	1.758	0.30( 0.30)	1.00	8876.1	10710.00
5	13272.22	41.78	1.713	0.30( 0.30)	1.00	9180.3	10410.00
6	13283.44	45.98	1.603	0.30( 0.30)	1.00	9834.6	10700.00
7	13307.51	52.65	1.484	0.30( 0.30)	1.00	10801.0	10400.00
8	13221.06	54.48	1.474	0.30( 0.30)	1.00	11026.2	10200.00
9	12812.72	59.84	1.445	0.30( 0.30)	1.00	11587.8	10300.00
10	12789.53	60.05	1.444	0.30( 0.30)	1.00	11602.3	10320.00
11	12292.18	64.78	1.413	0.30( 0.30)	1.00	11809.3	10210.00
12	11608.58	88.83	1.259	0.30( 0.30)	1.00	12502.4	10100.00

TOTAL AREA (ACRES) = 12502.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 13307.51 Tc (MIN.) = 52.650  
EFFECTIVE AREA (ACRES) = 10801.02 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 12502.4  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10724.00 = 45335.69 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10724.00 TO NODE 10820.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
-----

ELEVATION DATA: UPSTREAM (FEET) = 1320.32 DOWNSTREAM (FEET) = 1289.38  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1341.06 CHANNEL SLOPE = 0.0231  
GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 12.93  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.476

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	47.66	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 13332.72  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 15.00  
AVERAGE FLOW DEPTH (FEET) = 12.93 TRAVEL TIME (MIN.) = 1.49  
Tc (MIN.) = 54.14  
SUBAREA AREA (ACRES) = 47.66 SUBAREA RUNOFF (CFS) = 50.43  
EFFECTIVE AREA (ACRES) = 10848.68 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 12550.1 PEAK FLOW RATE (CFS) = 13307.51  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 12.91

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 12.91 FLOW VELOCITY (FEET/SEC.) = 14.99  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10820.00 = 46676.75 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10803.00 TO NODE 10820.00 IS CODE = 11  
-----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<  
-----

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11866.07	20.05	2.654	0.30( 0.30)	1.00	4165.8	10630.00
2	12564.84	30.71	2.000	0.30( 0.30)	1.00	6546.0	10600.00
3	13055.59	37.15	1.833	0.30( 0.30)	1.00	7995.2	10500.00
4	13281.02	41.53	1.719	0.30( 0.30)	1.00	8923.7	10710.00
5	13272.22	43.27	1.674	0.30( 0.30)	1.00	9227.9	10410.00
6	13283.44	47.47	1.564	0.30( 0.30)	1.00	9882.2	10700.00
7	13307.51	54.14	1.476	0.30( 0.30)	1.00	10848.7	10400.00
8	13221.06	55.98	1.466	0.30( 0.30)	1.00	11073.8	10200.00
9	12812.72	61.34	1.435	0.30( 0.30)	1.00	11635.4	10300.00
10	12789.53	61.55	1.434	0.30( 0.30)	1.00	11650.0	10320.00
11	12292.18	66.30	1.403	0.30( 0.30)	1.00	11857.0	10210.00
12	11608.58	90.38	1.249	0.30( 0.30)	1.00	12550.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10820.00 = 46676.75 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
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1 298.45 14.06 3.508 0.30( 0.30) 1.00 103.4 10800.00  
LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10820.00 = 4081.86 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11639.81	14.06	3.508	0.30( 0.30)	1.00	3025.6	10800.00
2	12085.10	20.05	2.654	0.30( 0.30)	1.00	4269.2	10630.00
3	12722.97	30.71	2.000	0.30( 0.30)	1.00	6649.3	10600.00
4	13198.20	37.15	1.833	0.30( 0.30)	1.00	8098.5	10500.00
5	13413.04	41.53	1.719	0.30( 0.30)	1.00	9027.1	10710.00
6	13400.02	43.27	1.674	0.30( 0.30)	1.00	9331.3	10410.00
7	13401.04	47.47	1.564	0.30( 0.30)	1.00	9985.6	10700.00
8	13416.89	54.14	1.476	0.30( 0.30)	1.00	10952.1	10400.00
9	13329.52	55.98	1.466	0.30( 0.30)	1.00	11177.2	10200.00
10	12918.35	61.34	1.435	0.30( 0.30)	1.00	11738.8	10300.00
11	12895.04	61.55	1.434	0.30( 0.30)	1.00	11753.4	10320.00
12	12394.85	66.30	1.403	0.30( 0.30)	1.00	11960.3	10210.00
13	11696.90	90.38	1.249	0.30( 0.30)	1.00	12653.5	10100.00
TOTAL AREA (ACRES) =		12653.5					

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 13416.89 Tc(MIN.) = 54.140  
EFFECTIVE AREA(ACRES) = 10952.05 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 12653.5  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10820.00 = 46676.75 FEET.

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FLOW PROCESS FROM NODE 10820.00 TO NODE 10840.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1289.38 DOWNSTREAM(FEET) = 1208.07  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2450.84 CHANNEL SLOPE = 0.0332  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.94  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.463  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 147.19 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 13493.91  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 17.20  
AVERAGE FLOW DEPTH(FEET) = 11.93 TRAVEL TIME(MIN.) = 2.38  
Tc(MIN.) = 56.52  
SUBAREA AREA(ACRES) = 147.19 SUBAREA RUNOFF(CFS) = 154.05  
EFFECTIVE AREA(ACRES) = 11099.24 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 12800.7 PEAK FLOW RATE(CFS) = 13416.89  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.90

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 11.90 FLOW VELOCITY(FEET/SEC.) = 17.17  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10840.00 = 49127.59 FEET.

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FLOW PROCESS FROM NODE 10820.00 TO NODE 10840.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 56.52

RAINFALL INTENSITY(INCH/HR) = 1.46

AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA(ACRES) = 11099.24

TOTAL STREAM AREA(ACRES) = 12800.66

PEAK FLOW RATE(CFS) AT CONFLUENCE = 13416.89

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FLOW PROCESS FROM NODE 10830.00 TO NODE 10831.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 299.89

ELEVATION DATA: UPSTREAM(FEET) = 3249.56 DOWNSTREAM(FEET) = 3166.67

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

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.939

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.941

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER						
"CHAPARRAL,NARROWLEAF"	-	0.88	0.30	1.000	0	8.94
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30						
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000						
SUBAREA RUNOFF(CFS) = 3.68						
TOTAL AREA(ACRES) = 0.88 PEAK FLOW RATE(CFS) = 3.68						

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FLOW PROCESS FROM NODE 10831.00 TO NODE 10832.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3166.67 DOWNSTREAM(FEET) = 2954.84  
CHANNEL LENGTH THRU SUBAREA(FEET) = 677.65 CHANNEL SLOPE = 0.3126  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.20  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.050  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

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USER-DEFINED          -      2.82    0.30    1.000    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      8.46
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.39
AVERAGE FLOW DEPTH(FEET) = 0.19 TRAVEL TIME(MIN.) = 2.57
Tc(MIN.) = 11.51
SUBAREA AREA(ACRES) =      2.82 SUBAREA RUNOFF(CFS) =      9.52
EFFECTIVE AREA(ACRES) =      3.70 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) =      3.7 PEAK FLOW RATE(CFS) =      12.49
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 0.23

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.23 FLOW VELOCITY(FEET/SEC.) = 5.11
LONGEST FLOWPATH FROM NODE 10830.00 TO NODE 10832.00 = 977.54 FEET.

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FLOW PROCESS FROM NODE 10832.00 TO NODE 10833.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2954.84 DOWNSTREAM(FEET) = 2765.08
CHANNEL LENGTH THRU SUBAREA(FEET) = 951.35 CHANNEL SLOPE = 0.1995
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 0.69
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.607
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/    SCS SOIL  AREA    Fp      Ap    SCS
LAND USE             GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -      29.25    0.30    1.000    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      56.22
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.61
AVERAGE FLOW DEPTH(FEET) = 0.65 TRAVEL TIME(MIN.) = 2.08
Tc(MIN.) = 13.60
SUBAREA AREA(ACRES) =      29.25 SUBAREA RUNOFF(CFS) =      87.06
EFFECTIVE AREA(ACRES) =      32.95 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) =      33.0 PEAK FLOW RATE(CFS) =      98.07
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 0.90

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.90 FLOW VELOCITY(FEET/SEC.) = 9.20
LONGEST FLOWPATH FROM NODE 10830.00 TO NODE 10833.00 = 1928.89 FEET.

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FLOW PROCESS FROM NODE 10833.00 TO NODE 10834.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2765.08 DOWNSTREAM(FEET) = 2446.09
CHANNEL LENGTH THRU SUBAREA(FEET) = 1959.29 CHANNEL SLOPE = 0.1628
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.51
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.098
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/    SCS SOIL  AREA    Fp      Ap    SCS
LAND USE             GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -      80.66    0.30    1.000    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      200.04
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.81
AVERAGE FLOW DEPTH(FEET) = 1.44 TRAVEL TIME(MIN.) = 3.02
Tc(MIN.) = 16.62
SUBAREA AREA(ACRES) =      80.66 SUBAREA RUNOFF(CFS) =      203.16
EFFECTIVE AREA(ACRES) =      113.61 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) =      113.6 PEAK FLOW RATE(CFS) =      286.15
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.75

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.75 FLOW VELOCITY(FEET/SEC.) = 12.10
LONGEST FLOWPATH FROM NODE 10830.00 TO NODE 10834.00 = 3888.18 FEET.

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FLOW PROCESS FROM NODE 10834.00 TO NODE 10835.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2446.09 DOWNSTREAM(FEET) = 1797.70
CHANNEL LENGTH THRU SUBAREA(FEET) = 2083.04 CHANNEL SLOPE = 0.3113
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.07
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.848
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/    SCS SOIL  AREA    Fp      Ap    SCS
LAND USE             GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -      196.68    0.30    1.000    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      511.89
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 18.06
AVERAGE FLOW DEPTH(FEET) = 2.02 TRAVEL TIME(MIN.) = 1.92
Tc(MIN.) = 18.54
SUBAREA AREA(ACRES) =      196.68 SUBAREA RUNOFF(CFS) =      451.07
EFFECTIVE AREA(ACRES) =      310.29 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) =      310.3 PEAK FLOW RATE(CFS) =      711.63
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.42

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.42 FLOW VELOCITY(FEET/SEC.) = 19.86  
 LONGEST FLOWPATH FROM NODE 10830.00 TO NODE 10835.00 = 5971.22 FEET.

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FLOW PROCESS FROM NODE 10835.00 TO NODE 10840.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1797.70 DOWNSTREAM(FEET) = 1208.07  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 3213.25 CHANNEL SLOPE = 0.1835  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.25

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.536

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	218.82	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 932.05

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 17.75

AVERAGE FLOW DEPTH(FEET) = 3.20 TRAVEL TIME(MIN.) = 3.02

Tc(MIN.) = 21.56

SUBAREA AREA(ACRES) = 218.82 SUBAREA RUNOFF(CFS) = 440.42

EFFECTIVE AREA(ACRES) = 529.11 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 529.11 PEAK FLOW RATE(CFS) = 1064.95

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.43

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.43 FLOW VELOCITY(FEET/SEC.) = 18.41  
 LONGEST FLOWPATH FROM NODE 10830.00 TO NODE 10840.00 = 9184.47 FEET.

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FLOW PROCESS FROM NODE 10835.00 TO NODE 10840.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

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TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 21.56

RAINFALL INTENSITY(INCH/HR) = 2.54

AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA(ACRES) = 529.11

TOTAL STREAM AREA(ACRES) = 529.11

PEAK FLOW RATE(CFS) AT CONFLUENCE = 1064.95

\*\* CONFLUENCE DATA \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
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NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE
1	11639.81	16.52	3.111	0.30( 0.30)	1.00	3172.7 10800.00
1	12085.10	22.49	2.464	0.30( 0.30)	1.00	4416.4 10630.00
1	12722.97	33.12	1.937	0.30( 0.30)	1.00	6796.5 10600.00
1	13198.20	39.53	1.771	0.30( 0.30)	1.00	8245.7 10500.00
1	13413.04	43.91	1.657	0.30( 0.30)	1.00	9174.3 10710.00
1	13400.02	45.65	1.612	0.30( 0.30)	1.00	9478.5 10410.00
1	13401.04	49.85	1.502	0.30( 0.30)	1.00	10132.8 10700.00
1	13416.89	56.52	1.463	0.30( 0.30)	1.00	11099.2 10400.00
1	13329.52	58.36	1.453	0.30( 0.30)	1.00	11324.4 10200.00
1	12918.35	63.74	1.420	0.30( 0.30)	1.00	11886.0 10300.00
1	12895.04	63.95	1.419	0.30( 0.30)	1.00	11900.6 10320.00
1	12394.85	68.73	1.388	0.30( 0.30)	1.00	12107.5 10210.00
1	11696.90	92.84	1.239	0.30( 0.30)	1.00	12800.7 10100.00
2	1064.95	21.56	2.536	0.30( 0.30)	1.00	529.1 10830.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE	
1	12665.75	16.52	3.111	0.30( 0.30)	1.00	3578.3 10800.00	
2	13080.60	21.56	2.536	0.30( 0.30)	1.00	4751.6 10830.00	
3	13115.41	22.49	2.464	0.30( 0.30)	1.00	4945.5 10630.00	
4	13502.65	33.12	1.937	0.30( 0.30)	1.00	7325.6 10600.00	
5	13898.77	39.53	1.771	0.30( 0.30)	1.00	8774.8 10500.00	
6	14059.30	43.91	1.657	0.30( 0.30)	1.00	9703.4 10710.00	
7	14024.64	45.65	1.612	0.30( 0.30)	1.00	10007.6 10410.00	
8	13973.46	49.85	1.502	0.30( 0.30)	1.00	10661.9 10700.00	
9	13970.65	56.52	1.463	0.30( 0.30)	1.00	11628.4 10400.00	
10	13878.55	58.36	1.453	0.30( 0.30)	1.00	11853.5 10200.00	
11	13451.69	63.74	1.420	0.30( 0.30)	1.00	12415.1 10300.00	
12	13427.72	63.95	1.419	0.30( 0.30)	1.00	12429.7 10320.00	
13	12912.91	68.73	1.388	0.30( 0.30)	1.00	12636.6 10210.00	
14	12143.85	92.84	1.239	0.30( 0.30)	1.00	13329.8 10100.00	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 14059.30 Tc(MIN.) = 43.91  
 EFFECTIVE AREA(ACRES) = 9703.41 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 13329.8  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10840.00 = 49127.59 FEET.

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FLOW PROCESS FROM NODE 10840.00 TO NODE 10841.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1208.07 DOWNSTREAM(FEET) = 1119.03  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 3050.12 CHANNEL SLOPE = 0.0292  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 12.61

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.577

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL	AREA	Fp	Ap	SCS
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LAND USE      GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED -    222.84  0.30    1.000    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14187.39
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.62
AVERAGE FLOW DEPTH(FEET) = 12.59 TRAVEL TIME(MIN.) = 3.06
Tc(MIN.) = 46.96
SUBAREA AREA(ACRES) = 222.84 SUBAREA RUNOFF(CFS) = 256.17
EFFECTIVE AREA(ACRES) = 9926.25 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 13552.6 PEAK FLOW RATE(CFS) = 14059.30
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 12.54

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 12.54 FLOW VELOCITY(FEET/SEC.) = 16.58
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10841.00 = 52177.71 FEET.

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*****
FLOW PROCESS FROM NODE 10841.00 TO NODE 10860.00 IS CODE = 56

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 1119.03 DOWNSTREAM(FEET) = 1087.70
CHANNEL LENGTH THRU SUBAREA(FEET) = 1318.14 CHANNEL SLOPE = 0.0238
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 13.25
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.540
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL  AREA   Fp   Ap   SCS
LAND USE           GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED      -    265.26  0.30  1.000  -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14207.33
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.42
AVERAGE FLOW DEPTH(FEET) = 13.23 TRAVEL TIME(MIN.) = 1.43
Tc(MIN.) = 48.39
SUBAREA AREA(ACRES) = 265.26 SUBAREA RUNOFF(CFS) = 296.06
EFFECTIVE AREA(ACRES) = 10191.51 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 13817.9 PEAK FLOW RATE(CFS) = 14059.30
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 13.16

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 13.16 FLOW VELOCITY(FEET/SEC.) = 15.37
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10860.00 = 53495.85 FEET.

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*****
FLOW PROCESS FROM NODE 10841.00 TO NODE 10860.00 IS CODE = 1

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-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
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TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 48.39
RAINFALL INTENSITY(INCH/HR) = 1.54
AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 10191.51
TOTAL STREAM AREA(ACRES) = 13817.87
PEAK FLOW RATE(CFS) AT CONFLUENCE = 14059.30

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*****
FLOW PROCESS FROM NODE 10850.00 TO NODE 10851.00 IS CODE = 21

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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

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INITIAL SUBAREA FLOW-LENGTH(FEET) = 311.88
ELEVATION DATA: UPSTREAM(FEET) = 3029.66 DOWNSTREAM(FEET) = 2922.38

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Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.691
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.074
SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL  AREA   Fp   Ap   SCS  Tc
LAND USE           GROUP  (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" -    2.73  0.30  1.000  0  8.69
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 11.73
TOTAL AREA(ACRES) = 2.73 PEAK FLOW RATE(CFS) = 11.73

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*****
FLOW PROCESS FROM NODE 10851.00 TO NODE 10852.00 IS CODE = 56

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2922.38 DOWNSTREAM(FEET) = 2684.61
CHANNEL LENGTH THRU SUBAREA(FEET) = 687.05 CHANNEL SLOPE = 0.3461
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 0.33
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.265
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL  AREA   Fp   Ap   SCS
LAND USE           GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED      -    5.11  0.30  1.000  -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.88
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.34
AVERAGE FLOW DEPTH(FEET) = 0.31 TRAVEL TIME(MIN.) = 1.81
Tc(MIN.) = 10.50

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SUBAREA AREA (ACRES) = 5.11 SUBAREA RUNOFF (CFS) = 18.24  
EFFECTIVE AREA (ACRES) = 7.84 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 7.8 PEAK FLOW RATE (CFS) = 27.98  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.37

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.37 FLOW VELOCITY (FEET/SEC.) = 7.06  
LONGEST FLOWPATH FROM NODE 10850.00 TO NODE 10852.00 = 998.93 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10852.00 TO NODE 10853.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2684.61 DOWNSTREAM (FEET) = 2306.25  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1924.58 CHANNEL SLOPE = 0.1966  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.09  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.563

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	60.02	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 117.04  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.71  
AVERAGE FLOW DEPTH (FEET) = 1.00 TRAVEL TIME (MIN.) = 3.31  
Tc (MIN.) = 13.80  
SUBAREA AREA (ACRES) = 60.02 SUBAREA RUNOFF (CFS) = 176.29  
EFFECTIVE AREA (ACRES) = 67.86 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 67.9 PEAK FLOW RATE (CFS) = 199.32  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.36

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.36 FLOW VELOCITY (FEET/SEC.) = 11.51  
LONGEST FLOWPATH FROM NODE 10850.00 TO NODE 10853.00 = 2923.51 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10853.00 TO NODE 10854.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2306.25 DOWNSTREAM (FEET) = 1555.12  
CHANNEL LENGTH THRU SUBAREA (FEET) = 3225.53 CHANNEL SLOPE = 0.2329  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.26  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.029

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	235.82	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 490.44  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 16.06  
AVERAGE FLOW DEPTH (FEET) = 2.14 TRAVEL TIME (MIN.) = 3.35  
Tc (MIN.) = 17.15

SUBAREA AREA (ACRES) = 235.82 SUBAREA RUNOFF (CFS) = 579.23  
EFFECTIVE AREA (ACRES) = 303.68 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 303.7 PEAK FLOW RATE (CFS) = 745.91  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.68

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 2.68 FLOW VELOCITY (FEET/SEC.) = 18.17  
LONGEST FLOWPATH FROM NODE 10850.00 TO NODE 10854.00 = 6149.04 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10854.00 TO NODE 10860.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1555.12 DOWNSTREAM (FEET) = 1087.70  
CHANNEL LENGTH THRU SUBAREA (FEET) = 3294.22 CHANNEL SLOPE = 0.1419  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.64  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.621

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	247.64	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1004.85  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 16.50  
AVERAGE FLOW DEPTH (FEET) = 3.56 TRAVEL TIME (MIN.) = 3.33  
Tc (MIN.) = 20.48  
SUBAREA AREA (ACRES) = 247.64 SUBAREA RUNOFF (CFS) = 517.24  
EFFECTIVE AREA (ACRES) = 551.32 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 551.3 PEAK FLOW RATE (CFS) = 1151.52  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.82

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 3.82 FLOW VELOCITY (FEET/SEC.) = 17.10  
LONGEST FLOWPATH FROM NODE 10850.00 TO NODE 10860.00 = 9443.26 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10854.00 TO NODE 10860.00 IS CODE = 1

-----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<  
 -----

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 20.48  
 RAINFALL INTENSITY(INCH/HR) = 2.62  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 551.32  
 TOTAL STREAM AREA(ACRES) = 551.32  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 1151.52

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12665.75	21.12	2.570	0.30( 0.30)	1.00	4066.4	10800.00
1	13080.60	26.12	2.211	0.30( 0.30)	1.00	5239.7	10830.00
1	13115.41	27.05	2.165	0.30( 0.30)	1.00	5433.6	10630.00
1	13502.65	37.65	1.820	0.30( 0.30)	1.00	7813.7	10600.00
1	13898.77	44.03	1.654	0.30( 0.30)	1.00	9262.9	10500.00
1	14059.30	48.39	1.540	0.30( 0.30)	1.00	10191.5	10710.00
1	14024.64	50.13	1.497	0.30( 0.30)	1.00	10495.7	10410.00
1	13973.46	54.34	1.475	0.30( 0.30)	1.00	11150.0	10700.00
1	13970.65	61.01	1.438	0.30( 0.30)	1.00	12116.5	10400.00
1	13878.55	62.86	1.426	0.30( 0.30)	1.00	12341.6	10200.00
1	13451.69	68.28	1.391	0.30( 0.30)	1.00	12903.2	10300.00
1	13427.72	68.49	1.389	0.30( 0.30)	1.00	12917.8	10320.00
1	12912.91	73.31	1.358	0.30( 0.30)	1.00	13124.7	10210.00
1	12143.85	97.50	1.218	0.30( 0.30)	1.00	13817.9	10100.00
2	1151.52	20.48	2.621	0.30( 0.30)	1.00	551.3	10850.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13703.70	20.48	2.621	0.30( 0.30)	1.00	4494.1	10850.00
2	13792.35	21.12	2.570	0.30( 0.30)	1.00	4617.7	10800.00
3	14029.00	26.12	2.211	0.30( 0.30)	1.00	5791.0	10830.00
4	14040.90	27.05	2.165	0.30( 0.30)	1.00	5984.9	10630.00
5	14256.85	37.65	1.820	0.30( 0.30)	1.00	8365.0	10600.00
6	14570.56	44.03	1.654	0.30( 0.30)	1.00	9814.3	10500.00
7	14674.63	48.39	1.540	0.30( 0.30)	1.00	10742.8	10710.00
8	14618.75	50.13	1.497	0.30( 0.30)	1.00	11047.0	10410.00
9	14556.30	54.34	1.475	0.30( 0.30)	1.00	11701.3	10700.00
10	14535.11	61.01	1.438	0.30( 0.30)	1.00	12667.8	10400.00
11	14437.10	62.86	1.426	0.30( 0.30)	1.00	12892.9	10200.00
12	13992.93	68.28	1.391	0.30( 0.30)	1.00	13454.5	10300.00
13	13968.28	68.49	1.389	0.30( 0.30)	1.00	13469.1	10320.00
14	13438.09	73.31	1.358	0.30( 0.30)	1.00	13676.1	10210.00
15	12599.39	97.50	1.218	0.30( 0.30)	1.00	14369.2	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 14674.63 Tc(MIN.) = 48.39

EFFECTIVE AREA(ACRES) = 10742.83 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 14369.2  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10860.00 = 53495.85 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10860.00 TO NODE 10921.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<  
 -----

ELEVATION DATA: UPSTREAM(FEET) = 1087.70 DOWNSTREAM(FEET) = 961.06  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 4791.22 CHANNEL SLOPE = 0.0264  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 13.22  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.480  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCSSOIL AREA Fp Ap SCSS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 402.51 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14888.40  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.23  
 AVERAGE FLOW DEPTH(FEET) = 13.19 TRAVEL TIME(MIN.) = 4.92  
 Tc(MIN.) = 53.31  
 SUBAREA AREA(ACRES) = 402.51 SUBAREA RUNOFF(CFS) = 427.54  
 EFFECTIVE AREA(ACRES) = 11145.34 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 14771.7 PEAK FLOW RATE(CFS) = 14674.63  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 13.10

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 13.10 FLOW VELOCITY(FEET/SEC.) = 16.17  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10921.00 = 58287.07 FEET.  
 -----

END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 14771.7 TC(MIN.) = 53.31  
 EFFECTIVE AREA(ACRES) = 11145.34 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.999  
 PEAK FLOW RATE(CFS) = 14674.63

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13703.70	25.47	2.243	0.30( 0.30)	1.00	4896.6	10850.00
2	13792.35	26.11	2.212	0.30( 0.30)	1.00	5020.2	10800.00
3	14029.00	31.09	1.990	0.30( 0.30)	1.00	6193.5	10830.00
4	14040.90	32.02	1.966	0.30( 0.30)	1.00	6387.4	10630.00
5	14256.85	42.60	1.691	0.30( 0.30)	1.00	8767.6	10600.00
6	14570.56	48.96	1.525	0.30( 0.30)	1.00	10216.8	10500.00
7	14674.63	53.31	1.480	0.30( 0.30)	1.00	11145.3	10710.00
8	14618.75	55.06	1.471	0.30( 0.30)	1.00	11449.5	10410.00
9	14556.30	59.27	1.448	0.30( 0.30)	1.00	12103.8	10700.00



10	14535.11	65.94	1.406	0.30 ( 0.30)	1.00	13070.3	10400.00
11	14437.10	67.80	1.394	0.30 ( 0.30)	1.00	13295.4	10200.00
12	13992.93	73.26	1.359	0.30 ( 0.30)	1.00	13857.0	10300.00
13	13968.28	73.48	1.357	0.30 ( 0.30)	1.00	13871.6	10320.00
14	13438.09	78.35	1.326	0.30 ( 0.30)	1.00	14078.6	10210.00
15	12599.39	102.63	1.195	0.30 ( 0.30)	1.00	14771.7	10100.00

=====  
=====  
END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

-----  
FILE NAME: S9.DAT  
TIME/DATE OF STUDY: 09:57 04/01/2013  
=====

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-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 7.056
- 2) 10.00; 4.371
- 3) 15.00; 3.309
- 4) 20.00; 2.658
- 5) 25.00; 2.267
- 6) 30.00; 2.018
- 7) 40.00; 1.759
- 8) 50.00; 1.498
- 9) 60.00; 1.444
- 10) 90.00; 1.251
- 11) 120.00; 1.119
- 12) 180.00; 0.957
- 13) 360.00; 0.738
- 14) 1440.00; 0.333

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10900.00 TO NODE 10901.00 IS CODE = 21  
-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 305.17  
ELEVATION DATA: UPSTREAM(FEET) = 3291.76 DOWNSTREAM(FEET) = 3104.08

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.671  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.622  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 1.19 0.30 1.000 0 7.67  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 5.70  
TOTAL AREA (ACRES) = 1.19 PEAK FLOW RATE (CFS) = 5.70

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10901.00 TO NODE 10902.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3104.08 DOWNSTREAM(FEET) = 2877.50  
CHANNEL LENGTH THRU SUBAREA(FEET) = 666.71 CHANNEL SLOPE = 0.3398  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.22  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.414  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN  
USER-DEFINED - 2.53 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.44  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.94  
AVERAGE FLOW DEPTH(FEET) = 0.20 TRAVEL TIME(MIN.) = 2.25  
Tc(MIN.) = 9.92  
SUBAREA AREA(ACRES) = 2.53 SUBAREA RUNOFF(CFS) = 9.37  
EFFECTIVE AREA(ACRES) = 3.72 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 3.7 PEAK FLOW RATE(CFS) = 13.77  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.24

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.24 FLOW VELOCITY(FEET/SEC.) = 5.45  
LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10902.00 = 971.88 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10902.00 TO NODE 10903.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2877.50 DOWNSTREAM(FEET) = 2643.95  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1916.39 CHANNEL SLOPE = 0.1219  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.93

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.392

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	36.43	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 65.62

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.81

AVERAGE FLOW DEPTH(FEET) = 0.83 TRAVEL TIME(MIN.) = 4.69

Tc(MIN.) = 14.61

SUBAREA AREA(ACRES) = 36.43 SUBAREA RUNOFF(CFS) = 101.37

EFFECTIVE AREA(ACRES) = 40.15 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 40.2 PEAK FLOW RATE(CFS) = 111.72

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.12

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.12 FLOW VELOCITY(FEET/SEC.) = 8.16

LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10903.00 = 2888.27 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10903.00 TO NODE 10904.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2643.95 DOWNSTREAM(FEET) = 2373.49  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1931.90 CHANNEL SLOPE = 0.1400  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.85

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.986

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	129.07	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 268.26

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.23

AVERAGE FLOW DEPTH(FEET) = 1.77 TRAVEL TIME(MIN.) = 2.87

Tc(MIN.) = 17.48

SUBAREA AREA(ACRES) = 129.07 SUBAREA RUNOFF(CFS) = 312.07

EFFECTIVE AREA(ACRES) = 169.22 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 169.2 PEAK FLOW RATE(CFS) = 409.15

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.22 FLOW VELOCITY(FEET/SEC.) = 12.74

LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10904.00 = 4820.17 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10904.00 TO NODE 10905.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2373.49 DOWNSTREAM(FEET) = 1817.76  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2764.66 CHANNEL SLOPE = 0.2010  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.37

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.625

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	117.70	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 532.40

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.64

AVERAGE FLOW DEPTH(FEET) = 2.32 TRAVEL TIME(MIN.) = 2.95

Tc(MIN.) = 20.42

SUBAREA AREA(ACRES) = 117.70 SUBAREA RUNOFF(CFS) = 246.28

EFFECTIVE AREA(ACRES) = 286.92 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 286.9 PEAK FLOW RATE(CFS) = 600.36

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.48

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.48 FLOW VELOCITY(FEET/SEC.) = 16.16

LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10905.00 = 7584.83 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10905.00 TO NODE 10906.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1817.76 DOWNSTREAM(FEET) = 1387.73  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2799.36 CHANNEL SLOPE = 0.1536  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.44

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.406

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	363.93	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 945.69  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.68  
 AVERAGE FLOW DEPTH(FEET) = 3.38 TRAVEL TIME(MIN.) = 2.80  
 Tc(MIN.) = 23.22  
 SUBAREA AREA(ACRES) = 363.93 SUBAREA RUNOFF(CFS) = 689.83  
 EFFECTIVE AREA(ACRES) = 650.85 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 650.8 PEAK FLOW RATE(CFS) = 1233.69  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.87

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.87 FLOW VELOCITY(FEET/SEC.) = 17.95  
 LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10906.00 = 10384.19 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10906.00 TO NODE 10920.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1387.73 DOWNSTREAM(FEET) = 1113.60  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2484.63 CHANNEL SLOPE = 0.1103  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.30  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.227

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
USER-DEFINED	-	56.85	0.30	1.000	-	

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1283.00  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.08  
 AVERAGE FLOW DEPTH(FEET) = 4.29 TRAVEL TIME(MIN.) = 2.57  
 Tc(MIN.) = 25.80

SUBAREA AREA(ACRES) = 56.85 SUBAREA RUNOFF(CFS) = 98.62  
 EFFECTIVE AREA(ACRES) = 707.70 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 707.7 PEAK FLOW RATE(CFS) = 1233.69  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.21

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.21 FLOW VELOCITY(FEET/SEC.) = 15.92  
 LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10920.00 = 12868.82 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10906.00 TO NODE 10920.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<<

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 25.80  
 RAINFALL INTENSITY(INCH/HR) = 2.23  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 707.70  
 TOTAL STREAM AREA(ACRES) = 707.70  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 1233.69

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

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 287.29  
 ELEVATION DATA: UPSTREAM(FEET) = 3119.43 DOWNSTREAM(FEET) = 3044.59

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.891  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.966  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	1.91	0.30	1.000	0	8.89

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 8.02  
 TOTAL AREA(ACRES) = 1.91 PEAK FLOW RATE(CFS) = 8.02

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10911.00 TO NODE 10912.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3044.59 DOWNSTREAM(FEET) = 2980.93  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 627.50 CHANNEL SLOPE = 0.1015  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.39  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.031

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
USER-DEFINED	-	4.16	0.30	1.000	-	

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 15.03  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.86  
 AVERAGE FLOW DEPTH(FEET) = 0.36 TRAVEL TIME(MIN.) = 2.71  
 Tc(MIN.) = 11.60  
 SUBAREA AREA(ACRES) = 4.16 SUBAREA RUNOFF(CFS) = 13.97  
 EFFECTIVE AREA(ACRES) = 6.07 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 6.1 PEAK FLOW RATE (CFS) = 20.38  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.44

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.44 FLOW VELOCITY (FEET/SEC.) = 4.28  
LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10912.00 = 914.79 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10912.00 TO NODE 10913.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2980.93 DOWNSTREAM (FEET) = 2876.01  
CHANNEL LENGTH THRU SUBAREA (FEET) = 984.99 CHANNEL SLOPE = 0.1065  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.80

\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.457

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	22.86	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 53.06

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.08

AVERAGE FLOW DEPTH (FEET) = 0.76 TRAVEL TIME (MIN.) = 2.70

Tc (MIN.) = 14.30

SUBAREA AREA (ACRES) = 22.86 SUBAREA RUNOFF (CFS) = 64.95

EFFECTIVE AREA (ACRES) = 28.93 AREA-AVERAGED Fm (INCH/HR) = 0.30

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 28.9 PEAK FLOW RATE (CFS) = 82.20

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.98

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.98 FLOW VELOCITY (FEET/SEC.) = 7.02  
LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10913.00 = 1899.78 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10913.00 TO NODE 10914.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2876.01 DOWNSTREAM (FEET) = 2832.29  
CHANNEL LENGTH THRU SUBAREA (FEET) = 939.99 CHANNEL SLOPE = 0.0465  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.78

\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.081

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	22.86	0.30	1.000	-

USER-DEFINED - 53.02 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 148.68  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.40  
AVERAGE FLOW DEPTH (FEET) = 1.73 TRAVEL TIME (MIN.) = 2.45  
Tc (MIN.) = 16.75  
SUBAREA AREA (ACRES) = 53.02 SUBAREA RUNOFF (CFS) = 132.70  
EFFECTIVE AREA (ACRES) = 81.95 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 81.9 PEAK FLOW RATE (CFS) = 205.11  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.06

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 2.06 FLOW VELOCITY (FEET/SEC.) = 7.04  
LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10914.00 = 2839.77 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10914.00 TO NODE 10915.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 2832.29 DOWNSTREAM (FEET) = 2769.58  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1006.52 CHANNEL SLOPE = 0.0623  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.42

\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.833

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	90.80	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 308.70

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.81

AVERAGE FLOW DEPTH (FEET) = 2.38 TRAVEL TIME (MIN.) = 1.90

Tc (MIN.) = 18.66

SUBAREA AREA (ACRES) = 90.80 SUBAREA RUNOFF (CFS) = 206.99

EFFECTIVE AREA (ACRES) = 172.75 AREA-AVERAGED Fm (INCH/HR) = 0.30

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 172.8 PEAK FLOW RATE (CFS) = 393.81

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.71

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 2.71 FLOW VELOCITY (FEET/SEC.) = 9.44  
LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10915.00 = 3846.29 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10915.00 TO NODE 10916.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2769.58 DOWNSTREAM(FEET) = 2453.21
CHANNEL LENGTH THRU SUBAREA(FEET) = 3003.36 CHANNEL SLOPE = 0.1053
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.31
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.471
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap   SCS
    LAND USE         GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED         -      311.96    0.30    1.000  -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 699.31
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.41
AVERAGE FLOW DEPTH(FEET) = 3.19 TRAVEL TIME(MIN.) = 3.73
Tc(MIN.) = 22.39
SUBAREA AREA(ACRES) = 311.96 SUBAREA RUNOFF(CFS) = 609.57
EFFECTIVE AREA(ACRES) = 484.71 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 484.7 PEAK FLOW RATE(CFS) = 947.12
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.73

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.73 FLOW VELOCITY(FEET/SEC.) = 14.57
LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10916.00 = 6849.65 FEET.

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FLOW PROCESS FROM NODE 10916.00 TO NODE 10917.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 2453.21 DOWNSTREAM(FEET) = 1787.18
CHANNEL LENGTH THRU SUBAREA(FEET) = 2846.14 CHANNEL SLOPE = 0.2340
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.40
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.291
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap   SCS
    LAND USE         GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED         -      238.62    0.30    1.000  -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1160.98
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 20.59
AVERAGE FLOW DEPTH(FEET) = 3.37 TRAVEL TIME(MIN.) = 2.30
Tc(MIN.) = 24.70
SUBAREA AREA(ACRES) = 238.62 SUBAREA RUNOFF(CFS) = 427.56
EFFECTIVE AREA(ACRES) = 723.33 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 723.3 PEAK FLOW RATE(CFS) = 1296.08
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.57

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.57 FLOW VELOCITY(FEET/SEC.) = 21.20
LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10917.00 = 9695.79 FEET.

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FLOW PROCESS FROM NODE 10917.00 TO NODE 10918.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 1787.18 DOWNSTREAM(FEET) = 1279.22
CHANNEL LENGTH THRU SUBAREA(FEET) = 2918.23 CHANNEL SLOPE = 0.1741
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 4.05
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.158
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap   SCS
    LAND USE         GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED         -      150.63    0.30    1.000  -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1422.04
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 19.53
AVERAGE FLOW DEPTH(FEET) = 4.03 TRAVEL TIME(MIN.) = 2.49
Tc(MIN.) = 27.19
SUBAREA AREA(ACRES) = 150.63 SUBAREA RUNOFF(CFS) = 251.91
EFFECTIVE AREA(ACRES) = 873.96 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 874.0 PEAK FLOW RATE(CFS) = 1461.62
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 4.09

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 4.09 FLOW VELOCITY(FEET/SEC.) = 19.68
LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10918.00 = 12614.02 FEET.

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FLOW PROCESS FROM NODE 10918.00 TO NODE 10920.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 1279.22 DOWNSTREAM(FEET) = 1113.60
CHANNEL LENGTH THRU SUBAREA(FEET) = 1664.50 CHANNEL SLOPE = 0.0995
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 4.78
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.073
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap   SCS
    LAND USE         GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED         -      60.16    0.30    1.000  -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1509.61

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TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 16.18  
 AVERAGE FLOW DEPTH (FEET) = 4.77 TRAVEL TIME (MIN.) = 1.71  
 Tc (MIN.) = 28.90  
 SUBAREA AREA (ACRES) = 60.16 SUBAREA RUNOFF (CFS) = 95.99  
 EFFECTIVE AREA (ACRES) = 934.12 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 934.1 PEAK FLOW RATE (CFS) = 1490.45  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 4.74

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 4.74 FLOW VELOCITY (FEET/SEC.) = 16.13  
 LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10920.00 = 14278.52 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10918.00 TO NODE 10920.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION (MIN.) = 28.90  
 RAINFALL INTENSITY (INCH/HR) = 2.07  
 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA (ACRES) = 934.12  
 TOTAL STREAM AREA (ACRES) = 934.12  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 1490.45

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1233.69	25.80	2.227	0.30 ( 0.30)	1.00	707.7	10900.00
2	1490.45	28.90	2.073	0.30 ( 0.30)	1.00	934.1	10910.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2680.07	25.80	2.227	0.30 ( 0.30)	1.00	1541.5	10900.00
2	2625.22	28.90	2.073	0.30 ( 0.30)	1.00	1641.8	10910.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 2680.07 Tc (MIN.) = 25.80  
 EFFECTIVE AREA (ACRES) = 1541.51 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 1641.8  
 LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10920.00 = 14278.52 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10920.00 TO NODE 10921.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1113.60 DOWNSTREAM (FEET) = 961.06  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2282.16 CHANNEL SLOPE = 0.0668  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 7.12  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.112

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	185.67	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2831.49

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 16.45

AVERAGE FLOW DEPTH (FEET) = 7.11 TRAVEL TIME (MIN.) = 2.31

Tc (MIN.) = 28.11

SUBAREA AREA (ACRES) = 185.67 SUBAREA RUNOFF (CFS) = 302.83

EFFECTIVE AREA (ACRES) = 1727.18 AREA-AVERAGED Fm (INCH/HR) = 0.30

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 1827.5 PEAK FLOW RATE (CFS) = 2817.08

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 7.09

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 7.09 FLOW VELOCITY (FEET/SEC.) = 16.43

LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10921.00 = 16560.68 FEET.

=====

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 1827.5 TC (MIN.) = 28.11

EFFECTIVE AREA (ACRES) = 1727.18 AREA-AVERAGED Fm (INCH/HR) = 0.30

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.000

PEAK FLOW RATE (CFS) = 2817.08

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2817.08	28.11	2.112	0.30 ( 0.30)	1.00	1727.2	10900.00
2	2773.57	31.23	1.986	0.30 ( 0.30)	1.00	1827.5	10910.00

=====

END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

-----  
FILE NAME: S10.DAT  
TIME/DATE OF STUDY: 09:57 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.868
- 2) 10.00; 4.278
- 3) 15.00; 3.249
- 4) 20.00; 2.620
- 5) 25.00; 2.240
- 6) 30.00; 1.995
- 7) 40.00; 1.736
- 8) 50.00; 1.482
- 9) 60.00; 1.420
- 10) 90.00; 1.225
- 11) 120.00; 1.092
- 12) 180.00; 0.931
- 13) 360.00; 0.714
- 14) 1440.00; 0.320

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*  

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11000.00 TO NODE 11001.00 IS CODE = 21  
-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 362.38  
ELEVATION DATA: UPSTREAM(FEET) = 2528.19 DOWNSTREAM(FEET) = 2375.55

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.863  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.867  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "OPEN BRUSH"	-	2.03	0.30	1.000	0	8.86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 8.34  
TOTAL AREA(ACRES) = 2.03 PEAK FLOW RATE(CFS) = 8.34

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11001.00 TO NODE 11002.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2375.55 DOWNSTREAM(FEET) = 2005.09  
CHANNEL LENGTH THRU SUBAREA(FEET) = 575.45 CHANNEL SLOPE = 0.6438  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.21  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.214  
SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	3.14	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 13.89  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.63  
AVERAGE FLOW DEPTH(FEET) = 0.20 TRAVEL TIME(MIN.) = 1.45  
Tc(MIN.) = 10.31  
SUBAREA AREA(ACRES) = 3.14 SUBAREA RUNOFF(CFS) = 11.06  
EFFECTIVE AREA(ACRES) = 5.17 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 5.2 PEAK FLOW RATE(CFS) = 18.21  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.24

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.24 FLOW VELOCITY(FEET/SEC.) = 7.26  
LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11002.00 = 937.83 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11002.00 TO NODE 11003.00 IS CODE = 56



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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2005.09 DOWNSTREAM(FEET) = 1450.44  
CHANNEL LENGTH THRU SUBAREA(FEET) = 962.43 CHANNEL SLOPE = 0.5763  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.43  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.883  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 16.53 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 44.90  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.94  
AVERAGE FLOW DEPTH(FEET) = 0.42 TRAVEL TIME(MIN.) = 1.61  
Tc(MIN.) = 11.92  
SUBAREA AREA(ACRES) = 16.53 SUBAREA RUNOFF(CFS) = 53.30  
EFFECTIVE AREA(ACRES) = 21.70 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 21.7 PEAK FLOW RATE(CFS) = 69.97  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.54

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.54 FLOW VELOCITY(FEET/SEC.) = 11.59  
LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11003.00 = 1900.26 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11003.00 TO NODE 11020.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 1450.44 DOWNSTREAM(FEET) = 939.63  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1351.71 CHANNEL SLOPE = 0.3779  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.84  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.496  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 30.99 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 114.63  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.99  
AVERAGE FLOW DEPTH(FEET) = 0.82 TRAVEL TIME(MIN.) = 1.88  
Tc(MIN.) = 13.80  
SUBAREA AREA(ACRES) = 30.99 SUBAREA RUNOFF(CFS) = 89.14  
EFFECTIVE AREA(ACRES) = 52.69 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 52.7 PEAK FLOW RATE(CFS) = 151.55

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.96

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.96 FLOW VELOCITY(FEET/SEC.) = 13.18  
LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11020.00 = 3251.97 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11003.00 TO NODE 11020.00 IS CODE = 10

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

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10860.00 TO NODE 10921.00 IS CODE = 15.1

-----  
>>>>DEFINE MEMORY BANK # 2 <<<<<

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PEAK FLOWRATE TABLE FILE NAME: S8.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13703.70	25.47	0.30 ( 0.30)	1.00	4896.6	10850.00
2	13792.35	26.11	0.30 ( 0.30)	1.00	5020.2	10800.00
3	14029.00	31.09	0.30 ( 0.30)	1.00	6193.5	10830.00
4	14040.90	32.02	0.30 ( 0.30)	1.00	6387.4	10630.00
5	14256.85	42.60	0.30 ( 0.30)	1.00	8767.6	10600.00
6	14570.56	48.96	0.30 ( 0.30)	1.00	10216.8	10500.00
7	14674.63	53.31	0.30 ( 0.30)	1.00	11145.3	10710.00
8	14618.75	55.06	0.30 ( 0.30)	1.00	11449.5	10410.00
9	14556.30	59.27	0.30 ( 0.30)	1.00	12103.8	10700.00
10	14535.11	65.94	0.30 ( 0.30)	1.00	13070.3	10400.00
11	14437.10	67.80	0.30 ( 0.30)	1.00	13295.4	10200.00
12	13992.93	73.26	0.30 ( 0.30)	1.00	13857.0	10300.00
13	13968.28	73.48	0.30 ( 0.30)	1.00	13871.6	10320.00
14	13438.09	78.35	0.30 ( 0.30)	1.00	14078.6	10210.00
15	12599.39	102.63	0.30 ( 0.30)	1.00	14771.7	10100.00

TOTAL AREA(ACRES) = 14771.7

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10920.00 TO NODE 10921.00 IS CODE = 15.1

-----  
>>>>DEFINE MEMORY BANK # 3 <<<<<

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PEAK FLOWRATE TABLE FILE NAME: S9.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2817.08	28.11	0.30 ( 0.30)	1.00	1727.2	10900.00
2	2773.57	31.23	0.30 ( 0.30)	1.00	1827.5	10910.00

TOTAL AREA(ACRES) = 1827.5

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10920.00 TO NODE 10921.00 IS CODE = 14.0

-----  
>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2817.08	28.11	0.30( 0.30)	1.00	1727.2	10900.00
2	2773.57	31.23	0.30( 0.30)	1.00	1827.5	10910.00
TOTAL AREA (ACRES) =						1827.5

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FLOW PROCESS FROM NODE 10860.00 TO NODE 10921.00 IS CODE = 11

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 >>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2817.08	28.11	2.088	0.30( 0.30)	1.00	1727.2	10900.00
2	2773.57	31.23	1.963	0.30( 0.30)	1.00	1827.5	10910.00
LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10921.00 = 16560.68 FEET.							

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13703.70	25.47	2.217	0.30( 0.30)	1.00	4896.6	10850.00
2	13792.35	26.11	2.186	0.30( 0.30)	1.00	5020.2	10800.00
3	14029.00	31.09	1.967	0.30( 0.30)	1.00	6193.5	10830.00
4	14040.90	32.02	1.943	0.30( 0.30)	1.00	6387.4	10630.00
5	14256.85	42.60	1.670	0.30( 0.30)	1.00	8767.6	10600.00
6	14570.56	48.96	1.508	0.30( 0.30)	1.00	10216.8	10500.00
7	14674.63	53.31	1.461	0.30( 0.30)	1.00	11145.3	10710.00
8	14618.75	55.06	1.451	0.30( 0.30)	1.00	11449.5	10410.00
9	14556.30	59.27	1.425	0.30( 0.30)	1.00	12103.8	10700.00
10	14535.11	65.94	1.381	0.30( 0.30)	1.00	13070.3	10400.00
11	14437.10	67.80	1.369	0.30( 0.30)	1.00	13295.4	10200.00
12	13992.93	73.26	1.334	0.30( 0.30)	1.00	13857.0	10300.00
13	13968.28	73.48	1.332	0.30( 0.30)	1.00	13871.6	10320.00
14	13438.09	78.35	1.301	0.30( 0.30)	1.00	14078.6	10210.00
15	12599.39	102.63	1.169	0.30( 0.30)	1.00	14771.7	10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10921.00 = 58287.07 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16441.06	25.47	2.217	0.30( 0.30)	1.00	6461.8	10850.00
2	16552.44	26.11	2.186	0.30( 0.30)	1.00	6624.5	10800.00
3	16704.45	28.11	2.088	0.30( 0.30)	1.00	7218.5	10900.00
4	16804.47	31.09	1.967	0.30( 0.30)	1.00	8016.6	10830.00
5	16804.32	31.23	1.963	0.30( 0.30)	1.00	8049.4	10910.00
6	16780.37	32.02	1.943	0.30( 0.30)	1.00	8214.9	10630.00
7	16541.29	42.60	1.670	0.30( 0.30)	1.00	10595.0	10600.00
8	16585.78	48.96	1.508	0.30( 0.30)	1.00	12044.3	10500.00
9	16611.49	53.31	1.461	0.30( 0.30)	1.00	12972.8	10710.00
10	16537.53	55.06	1.451	0.30( 0.30)	1.00	13277.0	10410.00
11	16431.56	59.27	1.425	0.30( 0.30)	1.00	13931.3	10700.00
12	16338.42	65.94	1.381	0.30( 0.30)	1.00	14897.8	10400.00
13	16220.26	67.80	1.369	0.30( 0.30)	1.00	15122.9	10200.00
14	15716.86	73.26	1.334	0.30( 0.30)	1.00	15684.5	10300.00

15	15689.87	73.48	1.332	0.30( 0.30)	1.00	15699.1	10320.00
16	15106.91	78.35	1.301	0.30( 0.30)	1.00	15906.1	10210.00
17	14048.59	102.63	1.169	0.30( 0.30)	1.00	16599.2	10100.00
TOTAL AREA (ACRES) =						16599.2	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 16804.47 Tc(MIN.) = 31.090  
 EFFECTIVE AREA(ACRES) = 8016.62 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 16599.2  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10921.00 = 58287.07 FEET.

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FLOW PROCESS FROM NODE 10921.00 TO NODE 11020.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 961.06 DOWNSTREAM(FEET) = 939.63  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 601.65 CHANNEL SLOPE = 0.0356  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 11.94  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.955  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCSSOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 18.29 0.30 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16818.09  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 21.39  
 AVERAGE FLOW DEPTH(FEET) = 11.94 TRAVEL TIME(MIN.) = 0.47  
 Tc(MIN.) = 31.56  
 SUBAREA AREA(ACRES) = 18.29 SUBAREA RUNOFF(CFS) = 27.24  
 EFFECTIVE AREA(ACRES) = 8034.91 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 16617.5 PEAK FLOW RATE(CFS) = 16804.47  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 11.94

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 11.94 FLOW VELOCITY(FEET/SEC.) = 21.39  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11020.00 = 58888.71 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11003.00 TO NODE 11020.00 IS CODE = 11

-----  
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<  
 =====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16441.06	25.94	2.194	0.30( 0.30)	1.00	6480.1	10850.00
2	16552.44	26.58	2.163	0.30( 0.30)	1.00	6642.8	10800.00

Node	Elevation	Tc	Intensity	Fp	Ap	Ae	Headwater
3	16704.45	28.58	2.065	0.30 ( 0.30)	1.00	7236.8	10900.00
4	16804.47	31.56	1.955	0.30 ( 0.30)	1.00	8034.9	10830.00
5	16804.32	31.69	1.951	0.30 ( 0.30)	1.00	8067.7	10910.00
6	16780.37	32.48	1.931	0.30 ( 0.30)	1.00	8233.2	10630.00
7	16541.29	43.07	1.658	0.30 ( 0.30)	1.00	10613.3	10600.00
8	16585.78	49.43	1.497	0.30 ( 0.30)	1.00	12062.5	10500.00
9	16611.49	53.78	1.459	0.30 ( 0.30)	1.00	12991.1	10710.00
10	16537.53	55.53	1.448	0.30 ( 0.30)	1.00	13295.3	10410.00
11	16431.56	59.74	1.422	0.30 ( 0.30)	1.00	13949.6	10700.00
12	16338.42	66.41	1.378	0.30 ( 0.30)	1.00	14916.1	10400.00
13	16220.26	68.27	1.366	0.30 ( 0.30)	1.00	15141.2	10200.00
14	15716.86	73.74	1.331	0.30 ( 0.30)	1.00	15702.8	10300.00
15	15689.87	73.96	1.329	0.30 ( 0.30)	1.00	15717.4	10320.00
16	15106.91	78.83	1.298	0.30 ( 0.30)	1.00	15924.3	10210.00
17	14048.59	103.12	1.167	0.30 ( 0.30)	1.00	16617.5	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11020.00 = 58888.71 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	151.55	13.80	3.496	0.30 ( 0.30)	1.00	52.7	11000.00

LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11020.00 = 3251.97 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14909.43	13.80	3.496	0.30 ( 0.30)	1.00	3499.6	11000.00
2	16530.86	25.94	2.194	0.30 ( 0.30)	1.00	6532.8	10850.00
3	16640.77	26.58	2.163	0.30 ( 0.30)	1.00	6695.5	10800.00
4	16788.13	28.58	2.065	0.30 ( 0.30)	1.00	7289.5	10900.00
5	16882.93	31.56	1.955	0.30 ( 0.30)	1.00	8087.6	10830.00
6	16882.62	31.69	1.951	0.30 ( 0.30)	1.00	8120.4	10910.00
7	16857.70	32.48	1.931	0.30 ( 0.30)	1.00	8285.9	10630.00
8	16605.70	43.07	1.658	0.30 ( 0.30)	1.00	10666.0	10600.00
9	16642.52	49.43	1.497	0.30 ( 0.30)	1.00	12115.2	10500.00
10	16666.43	53.78	1.459	0.30 ( 0.30)	1.00	13043.8	10710.00
11	16591.96	55.53	1.448	0.30 ( 0.30)	1.00	13348.0	10410.00
12	16484.75	59.74	1.422	0.30 ( 0.30)	1.00	14002.3	10700.00
13	16389.56	66.41	1.378	0.30 ( 0.30)	1.00	14968.8	10400.00
14	16270.82	68.27	1.366	0.30 ( 0.30)	1.00	15193.9	10200.00
15	15765.74	73.74	1.331	0.30 ( 0.30)	1.00	15755.5	10300.00
16	15738.68	73.96	1.329	0.30 ( 0.30)	1.00	15770.1	10320.00
17	15154.22	78.83	1.298	0.30 ( 0.30)	1.00	15977.0	10210.00
18	14089.70	103.12	1.167	0.30 ( 0.30)	1.00	16670.2	10100.00

TOTAL AREA (ACRES) = 16670.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE (CFS) = 16882.93 Tc (MIN.) = 31.559  
 EFFECTIVE AREA (ACRES) = 8087.60 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 16670.2  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11020.00 = 58888.71 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11020.00 TO NODE 11021.00 IS CODE = 56  
 -----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 939.63 DOWNSTREAM (FEET) = 865.22  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2876.19 CHANNEL SLOPE = 0.0259  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 12.98  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.890  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	191.02	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 17019.58  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 19.07  
 AVERAGE FLOW DEPTH (FEET) = 12.96 TRAVEL TIME (MIN.) = 2.51  
 Tc (MIN.) = 34.07  
 SUBAREA AREA (ACRES) = 191.02 SUBAREA RUNOFF (CFS) = 273.28  
 EFFECTIVE AREA (ACRES) = 8278.62 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 16861.2 PEAK FLOW RATE (CFS) = 16882.93  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 12.91

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 12.91 FLOW VELOCITY (FEET/SEC.) = 19.04  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11021.00 = 61764.91 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11021.00 TO NODE 11022.00 IS CODE = 56  
 -----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 865.22 DOWNSTREAM (FEET) = 752.60  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2892.47 CHANNEL SLOPE = 0.0389  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 11.82  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.833  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	320.06	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 17103.79  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 22.21  
 AVERAGE FLOW DEPTH (FEET) = 11.78 TRAVEL TIME (MIN.) = 2.17  
 Tc (MIN.) = 36.24  
 SUBAREA AREA (ACRES) = 320.06 SUBAREA RUNOFF (CFS) = 441.70  
 EFFECTIVE AREA (ACRES) = 8598.68 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 17181.2 PEAK FLOW RATE (CFS) = 16882.93  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.71

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 11.71 FLOW VELOCITY(FEET/SEC.) = 22.12  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11022.00 = 64657.38 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11022.00 TO NODE 11023.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 752.60 DOWNSTREAM(FEET) = 737.50  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1864.15 CHANNEL SLOPE = 0.0081  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 17.00  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.768  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	226.98	0.30	0.986	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.986  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 17033.37  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.41  
AVERAGE FLOW DEPTH(FEET) = 16.96 TRAVEL TIME(MIN.) = 2.50  
Tc(MIN.) = 38.75  
SUBAREA AREA(ACRES) = 226.98 SUBAREA RUNOFF(CFS) = 300.86  
EFFECTIVE AREA(ACRES) = 8825.66 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 17408.2 PEAK FLOW RATE(CFS) = 16882.93  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 16.90

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 16.90 FLOW VELOCITY(FEET/SEC.) = 12.38  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11023.00 = 66521.52 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11023.00 TO NODE 11363.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 737.50 DOWNSTREAM(FEET) = 678.93  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2632.50 CHANNEL SLOPE = 0.0222  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 13.42  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.706  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	124.84	0.30	0.992	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.992  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16962.06  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 18.03  
AVERAGE FLOW DEPTH(FEET) = 13.40 TRAVEL TIME(MIN.) = 2.43  
Tc(MIN.) = 41.18  
SUBAREA AREA(ACRES) = 124.84 SUBAREA RUNOFF(CFS) = 158.25  
EFFECTIVE AREA(ACRES) = 8950.50 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 17533.1 PEAK FLOW RATE(CFS) = 16882.93  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 13.37

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 13.37 FLOW VELOCITY(FEET/SEC.) = 18.01  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11363.00 = 69154.02 FEET.

=====

END OF STUDY SUMMARY:  
TOTAL AREA(ACRES) = 17533.1 TC(MIN.) = 41.18  
EFFECTIVE AREA(ACRES) = 8950.50 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.999  
PEAK FLOW RATE(CFS) = 16882.93

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14909.43	23.72	2.337	0.30( 0.30)	1.00	4362.5	11000.00
2	16530.86	35.62	1.850	0.30( 0.30)	1.00	7395.7	10850.00
3	16640.77	36.23	1.834	0.30( 0.30)	1.00	7558.4	10800.00
4	16788.13	38.21	1.782	0.30( 0.30)	1.00	8152.4	10900.00
5	16882.93	41.18	1.706	0.30( 0.30)	1.00	8950.5	10830.00
6	16882.62	41.32	1.703	0.30( 0.30)	1.00	8983.3	10910.00
7	16857.70	42.11	1.682	0.30( 0.30)	1.00	9148.8	10630.00
8	16605.70	52.74	1.465	0.30( 0.30)	1.00	11528.9	10600.00
9	16642.52	59.09	1.426	0.30( 0.30)	1.00	12978.1	10500.00
10	16666.43	63.44	1.398	0.30( 0.30)	1.00	13906.7	10710.00
11	16591.96	65.20	1.386	0.30( 0.30)	1.00	14210.9	10410.00
12	16484.75	69.43	1.359	0.30( 0.30)	1.00	14865.2	10700.00
13	16389.56	76.12	1.315	0.30( 0.30)	1.00	15831.7	10400.00
14	16270.82	77.99	1.303	0.30( 0.30)	1.00	16056.8	10200.00
15	15765.74	83.54	1.267	0.30( 0.30)	1.00	16618.4	10300.00
16	15738.68	83.76	1.266	0.30( 0.30)	1.00	16633.0	10320.00
17	15154.22	88.73	1.233	0.30( 0.30)	1.00	16839.9	10210.00
18	14089.70	113.21	1.122	0.30( 0.30)	1.00	17533.1	10100.00

=====

END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

-----  
FILE NAME: S11.DAT  
TIME/DATE OF STUDY: 09:58 04/01/2013  
=====

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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

---\*TIME-OF-CONCENTRATION MODEL\*---

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.868
- 2) 10.00; 4.278
- 3) 15.00; 3.249
- 4) 20.00; 2.620
- 5) 25.00; 2.240
- 6) 30.00; 1.995
- 7) 40.00; 1.736
- 8) 50.00; 1.482
- 9) 60.00; 1.420
- 10) 90.00; 1.225
- 11) 120.00; 1.092
- 12) 180.00; 0.931
- 13) 360.00; 0.714
- 14) 1440.00; 0.320

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11101.00 TO NODE 11102.00 IS CODE = 21  
-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 920.30  
ELEVATION DATA: UPSTREAM(FEET) = 4391.58 DOWNSTREAM(FEET) = 4080.28

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$   
SUBAREA ANALYSIS USED MINIMUM  $T_c$ (MIN.) = 13.444  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.569

SUBAREA  $T_c$  AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	$F_p$ (INCH/HR)	$A_p$ (DECIMAL)	SCS CN	$T_c$ (MIN.)
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	-	2.68	0.30	1.000	0	13.44

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION,  $A_p$  = 1.000

SUBAREA RUNOFF(CFS) = 7.89

TOTAL AREA(ACRES) = 2.68 PEAK FLOW RATE(CFS) = 7.89

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11102.00 TO NODE 11103.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 4080.28 DOWNSTREAM(FEET) = 3876.52  
CHANNEL LENGTH THRU SUBAREA(FEET) = 959.85 CHANNEL SLOPE = 0.2123  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.71

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.192

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	$F_p$ (INCH/HR)	$A_p$ (DECIMAL)	SCS CN
USER-DEFINED	-	39.96	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION,  $A_p$  = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 60.06

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.95

AVERAGE FLOW DEPTH(FEET) = 0.67 TRAVEL TIME(MIN.) = 2.01

$T_c$ (MIN.) = 15.46

SUBAREA AREA(ACRES) = 39.96 SUBAREA RUNOFF(CFS) = 104.00

EFFECTIVE AREA(ACRES) = 42.64 AREA-AVERAGED  $F_m$ (INCH/HR) = 0.30

AREA-AVERAGED  $F_p$ (INCH/HR) = 0.30 AREA-AVERAGED  $A_p$  = 1.00

TOTAL AREA(ACRES) = 42.6 PEAK FLOW RATE(CFS) = 110.97

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.95

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.95 FLOW VELOCITY(FEET/SEC.) = 9.81

LONGEST FLOWPATH FROM NODE 11101.00 TO NODE 11103.00 = 1880.15 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11103.00 TO NODE 11104.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3876.52 DOWNSTREAM(FEET) = 3625.86  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1902.80 CHANNEL SLOPE = 0.1317  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.57

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.792

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	75.64	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 196.05

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.99

AVERAGE FLOW DEPTH(FEET) = 1.51 TRAVEL TIME(MIN.) = 3.17

Tc(MIN.) = 18.63

SUBAREA AREA(ACRES) = 75.64 SUBAREA RUNOFF(CFS) = 169.67

EFFECTIVE AREA(ACRES) = 118.28 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 118.3 PEAK FLOW RATE(CFS) = 265.31

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.78

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.78 FLOW VELOCITY(FEET/SEC.) = 10.97

LONGEST FLOWPATH FROM NODE 11101.00 TO NODE 11104.00 = 3782.95 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11104.00 TO NODE 11105.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3625.86 DOWNSTREAM(FEET) = 3222.66  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2898.91 CHANNEL SLOPE = 0.1391  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.35

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.439

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	167.73	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 427.11

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.88

AVERAGE FLOW DEPTH(FEET) = 2.28 TRAVEL TIME(MIN.) = 3.75

Tc(MIN.) = 22.38

SUBAREA AREA(ACRES) = 167.73 SUBAREA RUNOFF(CFS) = 322.90

EFFECTIVE AREA(ACRES) = 286.01 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 286.0 PEAK FLOW RATE(CFS) = 550.60

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.61

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.61 FLOW VELOCITY(FEET/SEC.) = 13.85

LONGEST FLOWPATH FROM NODE 11101.00 TO NODE 11105.00 = 6681.86 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11105.00 TO NODE 11121.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3222.66 DOWNSTREAM(FEET) = 2952.48  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2480.35 CHANNEL SLOPE = 0.1089  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.38

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.223

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	252.33	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 769.07

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.91

AVERAGE FLOW DEPTH(FEET) = 3.32 TRAVEL TIME(MIN.) = 2.97

Tc(MIN.) = 25.35

SUBAREA AREA(ACRES) = 252.33 SUBAREA RUNOFF(CFS) = 436.64

EFFECTIVE AREA(ACRES) = 538.34 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 538.3 PEAK FLOW RATE(CFS) = 931.57

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.66

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.66 FLOW VELOCITY(FEET/SEC.) = 14.67

LONGEST FLOWPATH FROM NODE 11101.00 TO NODE 11121.00 = 9162.21 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11105.00 TO NODE 11121.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 25.35

RAINFALL INTENSITY(INCH/HR) = 2.22

AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA(ACRES) = 538.34

TOTAL STREAM AREA(ACRES) = 538.34

PEAK FLOW RATE(CFS) AT CONFLUENCE = 931.57

```

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

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 8.552
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 5.028
SUBAREA Tc AND LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS   Tc
LAND USE           GROUP   (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" -         1.49   0.30   1.000   0   8.55
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF (CFS) = 6.34
TOTAL AREA (ACRES) = 1.49 PEAK FLOW RATE (CFS) = 6.34

*****
FLOW PROCESS FROM NODE 11112.00 TO NODE 11113.00 IS CODE = 56
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<
=====
ELEVATION DATA: UPSTREAM (FEET) = 3956.68 DOWNSTREAM (FEET) = 3752.68
CHANNEL LENGTH THRU SUBAREA (FEET) = 665.35 CHANNEL SLOPE = 0.3066
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT (FEET) = 0.37
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 4.219
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE           GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED       -         9.55   0.30   1.000   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 23.25
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.39
AVERAGE FLOW DEPTH (FEET) = 0.34 TRAVEL TIME (MIN.) = 1.73
Tc (MIN.) = 10.29
SUBAREA AREA (ACRES) = 9.55 SUBAREA RUNOFF (CFS) = 33.69
EFFECTIVE AREA (ACRES) = 11.04 AREA-AVERAGED Fm (INCH/HR) = 0.30
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA (ACRES) = 11.0 PEAK FLOW RATE (CFS) = 38.94
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT (FEET) = 0.46

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH (FEET) = 0.46 FLOW VELOCITY (FEET/SEC.) = 7.71
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11113.00 = 995.08 FEET.

*****
FLOW PROCESS FROM NODE 11113.00 TO NODE 11114.00 IS CODE = 56

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<
=====
ELEVATION DATA: UPSTREAM (FEET) = 3752.68 DOWNSTREAM (FEET) = 3541.57
CHANNEL LENGTH THRU SUBAREA (FEET) = 955.83 CHANNEL SLOPE = 0.2209
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT (FEET) = 0.81
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.851
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE           GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED       -         26.09   0.30   1.000   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 80.71
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.91
AVERAGE FLOW DEPTH (FEET) = 0.78 TRAVEL TIME (MIN.) = 1.79
Tc (MIN.) = 12.07
SUBAREA AREA (ACRES) = 26.09 SUBAREA RUNOFF (CFS) = 83.39
EFFECTIVE AREA (ACRES) = 37.13 AREA-AVERAGED Fm (INCH/HR) = 0.30
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA (ACRES) = 37.1 PEAK FLOW RATE (CFS) = 118.67
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT (FEET) = 0.98

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH (FEET) = 0.98 FLOW VELOCITY (FEET/SEC.) = 10.13
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11114.00 = 1950.91 FEET.

*****
FLOW PROCESS FROM NODE 11114.00 TO NODE 11115.00 IS CODE = 56
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<
=====
ELEVATION DATA: UPSTREAM (FEET) = 3541.57 DOWNSTREAM (FEET) = 3320.00
CHANNEL LENGTH THRU SUBAREA (FEET) = 1889.90 CHANNEL SLOPE = 0.1172
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT (FEET) = 1.58
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.198
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE           GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED       -         51.13   0.30   1.000   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 185.56
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.46
AVERAGE FLOW DEPTH (FEET) = 1.51 TRAVEL TIME (MIN.) = 3.33
Tc (MIN.) = 15.40
SUBAREA AREA (ACRES) = 51.13 SUBAREA RUNOFF (CFS) = 133.36
EFFECTIVE AREA (ACRES) = 88.26 AREA-AVERAGED Fm (INCH/HR) = 0.30
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA (ACRES) = 88.3 PEAK FLOW RATE (CFS) = 230.21

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GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.70

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.70 FLOW VELOCITY (FEET/SEC.) = 10.07  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11115.00 = 3840.81 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11115.00 TO NODE 11116.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 3320.00 DOWNSTREAM (FEET) = 3162.36  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1883.45 CHANNEL SLOPE = 0.0837  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.79  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.836

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	193.52	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 451.66  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.92  
AVERAGE FLOW DEPTH (FEET) = 2.69 TRAVEL TIME (MIN.) = 2.88  
Tc (MIN.) = 18.28  
SUBAREA AREA (ACRES) = 193.52 SUBAREA RUNOFF (CFS) = 441.75  
EFFECTIVE AREA (ACRES) = 281.78 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 281.8 PEAK FLOW RATE (CFS) = 643.23  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.24

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 3.24 FLOW VELOCITY (FEET/SEC.) = 12.05  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11116.00 = 5724.26 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11116.00 TO NODE 11117.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 3162.36 DOWNSTREAM (FEET) = 3062.66  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1903.90 CHANNEL SLOPE = 0.0524  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 4.01  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.523

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	112.47	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 755.83  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.61  
AVERAGE FLOW DEPTH (FEET) = 3.97 TRAVEL TIME (MIN.) = 2.99  
Tc (MIN.) = 21.27  
SUBAREA AREA (ACRES) = 112.47 SUBAREA RUNOFF (CFS) = 225.07  
EFFECTIVE AREA (ACRES) = 394.25 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 394.2 PEAK FLOW RATE (CFS) = 788.95  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 4.05

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 4.05 FLOW VELOCITY (FEET/SEC.) = 10.75  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11117.00 = 7628.16 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11117.00 TO NODE 11121.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 3062.66 DOWNSTREAM (FEET) = 2952.48  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1878.40 CHANNEL SLOPE = 0.0587  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 4.07  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.314

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	51.63	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 835.75  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.38  
AVERAGE FLOW DEPTH (FEET) = 4.06 TRAVEL TIME (MIN.) = 2.75  
Tc (MIN.) = 24.02  
SUBAREA AREA (ACRES) = 51.63 SUBAREA RUNOFF (CFS) = 93.60  
EFFECTIVE AREA (ACRES) = 445.88 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 445.9 PEAK FLOW RATE (CFS) = 808.34  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.99

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 3.99 FLOW VELOCITY (FEET/SEC.) = 11.28  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11121.00 = 9506.56 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11117.00 TO NODE 11121.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<



TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 24.02  
 RAINFALL INTENSITY(INCH/HR) = 2.31  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 445.88  
 TOTAL STREAM AREA(ACRES) = 445.88  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 808.34

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	931.57	25.35	2.223	0.30( 0.30)	1.00	538.3	11101.00
2	808.34	24.02	2.314	0.30( 0.30)	1.00	445.9	11111.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1733.06	24.02	2.314	0.30( 0.30)	1.00	956.0	11111.00
2	1703.14	25.35	2.223	0.30( 0.30)	1.00	984.2	11101.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 1733.06 Tc(MIN.) = 24.02  
 EFFECTIVE AREA(ACRES) = 955.95 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 984.2  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11121.00 = 9506.56 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11121.00 TO NODE 11122.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 2952.48 DOWNSTREAM(FEET) = 2639.37  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2687.92 CHANNEL SLOPE = 0.1165  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.13  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.167  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 170.98 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1876.72  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 18.14  
 AVERAGE FLOW DEPTH(FEET) = 5.11 TRAVEL TIME(MIN.) = 2.47  
 Tc(MIN.) = 26.49  
 SUBAREA AREA(ACRES) = 170.98 SUBAREA RUNOFF(CFS) = 287.29  
 EFFECTIVE AREA(ACRES) = 1126.93 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1155.2 PEAK FLOW RATE(CFS) = 1893.52  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.14  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 5.14 FLOW VELOCITY(FEET/SEC.) = 18.18  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11122.00 = 12194.48 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11122.00 TO NODE 11141.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 2639.37 DOWNSTREAM(FEET) = 1954.20  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 3696.53 CHANNEL SLOPE = 0.1854  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.69  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.029  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 114.61 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1982.69  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 21.83  
 AVERAGE FLOW DEPTH(FEET) = 4.69 TRAVEL TIME(MIN.) = 2.82  
 Tc(MIN.) = 29.31  
 SUBAREA AREA(ACRES) = 114.61 SUBAREA RUNOFF(CFS) = 178.31  
 EFFECTIVE AREA(ACRES) = 1241.54 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 1269.8 PEAK FLOW RATE(CFS) = 1931.59  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.63

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.63 FLOW VELOCITY(FEET/SEC.) = 21.69  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11141.00 = 15891.01 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11122.00 TO NODE 11141.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 =====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 29.31  
 RAINFALL INTENSITY(INCH/HR) = 2.03  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 1241.54  
 TOTAL STREAM AREA(ACRES) = 1269.81  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 1931.59

\*\*\*\*\*

FLOW PROCESS FROM NODE 11130.00 TO NODE 11131.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH (FEET) = 259.85  
ELEVATION DATA: UPSTREAM (FEET) = 3923.93 DOWNSTREAM (FEET) = 3765.35

Tc = K \* [(LENGTH\*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20  
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 7.204  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 5.726  
SUBAREA Tc AND LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL, NARROWLEAF" - 1.27 0.30 1.000 0 7.20  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF (CFS) = 6.20  
TOTAL AREA (ACRES) = 1.27 PEAK FLOW RATE (CFS) = 6.20

\*\*\*\*\*

FLOW PROCESS FROM NODE 11131.00 TO NODE 11132.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 3765.35 DOWNSTREAM (FEET) = 3414.86  
CHANNEL LENGTH THRU SUBAREA (FEET) = 674.05 CHANNEL SLOPE = 0.5200  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\* ESTIMATED CHANNEL HEIGHT (FEET) = 0.29  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 4.909  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 6.52 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 19.80  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.12  
AVERAGE FLOW DEPTH (FEET) = 0.26 TRAVEL TIME (MIN.) = 1.58  
Tc (MIN.) = 8.78  
SUBAREA AREA (ACRES) = 6.52 SUBAREA RUNOFF (CFS) = 27.04  
EFFECTIVE AREA (ACRES) = 7.79 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 7.8 PEAK FLOW RATE (CFS) = 32.31  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\* ESTIMATED CHANNEL HEIGHT (FEET) = 0.36

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.36 FLOW VELOCITY (FEET/SEC.) = 8.48  
LONGEST FLOWPATH FROM NODE 11130.00 TO NODE 11132.00 = 933.90 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11132.00 TO NODE 11133.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 3414.86 DOWNSTREAM (FEET) = 2699.51  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1813.44 CHANNEL SLOPE = 0.3945  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\* ESTIMATED CHANNEL HEIGHT (FEET) = 0.83  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.996  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 41.63 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 102.07  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.69  
AVERAGE FLOW DEPTH (FEET) = 0.76 TRAVEL TIME (MIN.) = 2.59  
Tc (MIN.) = 11.37  
SUBAREA AREA (ACRES) = 41.63 SUBAREA RUNOFF (CFS) = 138.50  
EFFECTIVE AREA (ACRES) = 49.42 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 49.4 PEAK FLOW RATE (CFS) = 164.41  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\* ESTIMATED CHANNEL HEIGHT (FEET) = 1.00

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.00 FLOW VELOCITY (FEET/SEC.) = 13.76  
LONGEST FLOWPATH FROM NODE 11130.00 TO NODE 11133.00 = 2747.34 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11133.00 TO NODE 11134.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 2699.51 DOWNSTREAM (FEET) = 2464.06  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1053.33 CHANNEL SLOPE = 0.2235  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\* ESTIMATED CHANNEL HEIGHT (FEET) = 1.94  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.752  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 142.85 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 386.47  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 14.77  
AVERAGE FLOW DEPTH (FEET) = 1.90 TRAVEL TIME (MIN.) = 1.19  
Tc (MIN.) = 12.56  
SUBAREA AREA (ACRES) = 142.85 SUBAREA RUNOFF (CFS) = 443.80  
EFFECTIVE AREA (ACRES) = 192.27 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 192.3 PEAK FLOW RATE (CFS) = 597.33  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.41

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 2.41 FLOW VELOCITY (FEET/SEC.) = 16.76  
LONGEST FLOWPATH FROM NODE 11130.00 TO NODE 11134.00 = 3800.67 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11134.00 TO NODE 11141.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2464.06 DOWNSTREAM (FEET) = 1954.20  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1291.98 CHANNEL SLOPE = 0.3946  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.13

\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.540

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	24.58	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 633.17

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 20.90

AVERAGE FLOW DEPTH (FEET) = 2.13 TRAVEL TIME (MIN.) = 1.03

Tc (MIN.) = 13.59

SUBAREA AREA (ACRES) = 24.58 SUBAREA RUNOFF (CFS) = 71.67

EFFECTIVE AREA (ACRES) = 216.85 AREA-AVERAGED Fm (INCH/HR) = 0.30

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 216.9 PEAK FLOW RATE (CFS) = 632.31

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.13

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 2.13 FLOW VELOCITY (FEET/SEC.) = 20.87

LONGEST FLOWPATH FROM NODE 11130.00 TO NODE 11141.00 = 5092.65 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11134.00 TO NODE 11141.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION (MIN.) = 13.59

RAINFALL INTENSITY (INCH/HR) = 3.54

AREA-AVERAGED Fm (INCH/HR) = 0.30

AREA-AVERAGED Fp (INCH/HR) = 0.30

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA (ACRES) = 216.85

TOTAL STREAM AREA (ACRES) = 216.85

PEAK FLOW RATE (CFS) AT CONFLUENCE = 632.31

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1931.59	29.31	2.029	0.30 ( 0.30)	1.00	1241.5	11111.00
1	1917.57	30.66	1.978	0.30 ( 0.30)	1.00	1269.8	11101.00
2	632.31	13.59	3.540	0.30 ( 0.30)	1.00	216.9	11130.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2310.24	13.59	3.540	0.30 ( 0.30)	1.00	792.3	11130.00
2	2268.97	29.31	2.029	0.30 ( 0.30)	1.00	1458.4	11111.00
3	2245.04	30.66	1.978	0.30 ( 0.30)	1.00	1486.7	11101.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 2310.24 Tc (MIN.) = 13.59

EFFECTIVE AREA (ACRES) = 792.29 AREA-AVERAGED Fm (INCH/HR) = 0.30

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 1486.7

LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11141.00 = 15891.01 FEET.

-----

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 1486.7 TC (MIN.) = 13.59

EFFECTIVE AREA (ACRES) = 792.29 AREA-AVERAGED Fm (INCH/HR) = 0.30

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.000

PEAK FLOW RATE (CFS) = 2310.24

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2310.24	13.59	3.540	0.30 ( 0.30)	1.00	792.3	11130.00
2	2268.97	29.31	2.029	0.30 ( 0.30)	1.00	1458.4	11111.00
3	2245.04	30.66	1.978	0.30 ( 0.30)	1.00	1486.7	11101.00

-----

END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

-----  
FILE NAME: S12.DAT  
TIME/DATE OF STUDY: 09:58 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.868
- 2) 10.00; 4.278
- 3) 15.00; 3.249
- 4) 20.00; 2.620
- 5) 25.00; 2.240
- 6) 30.00; 1.995
- 7) 40.00; 1.736
- 8) 50.00; 1.482
- 9) 60.00; 1.420
- 10) 90.00; 1.225
- 11) 120.00; 1.092
- 12) 180.00; 0.931
- 13) 360.00; 0.714
- 14) 1440.00; 0.320

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11220.00 TO NODE 11221.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 762.39  
ELEVATION DATA: UPSTREAM(FEET) = 3797.72 DOWNSTREAM(FEET) = 3296.86

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.919  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.089  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 5.02 0.30 1.000 0 10.92  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 17.12  
TOTAL AREA (ACRES) = 5.02 PEAK FLOW RATE (CFS) = 17.12

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11221.00 TO NODE 11223.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3296.86 DOWNSTREAM(FEET) = 2738.96  
CHANNEL LENGTH THRU SUBAREA(FEET) = 912.82 CHANNEL SLOPE = 0.6112  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.50  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.807  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN  
USER-DEFINED - 26.44 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 58.92  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.11  
AVERAGE FLOW DEPTH(FEET) = 0.48 TRAVEL TIME(MIN.) = 1.37  
Tc(MIN.) = 12.29  
SUBAREA AREA(ACRES) = 26.44 SUBAREA RUNOFF(CFS) = 83.46  
EFFECTIVE AREA(ACRES) = 31.46 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 31.5 PEAK FLOW RATE(CFS) = 99.30  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.66

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.66 FLOW VELOCITY(FEET/SEC.) = 13.31  
LONGEST FLOWPATH FROM NODE 11220.00 TO NODE 11223.00 = 1675.21 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11223.00 TO NODE 11224.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2738.96 DOWNSTREAM(FEET) = 2370.12  
CHANNEL LENGTH THRU SUBAREA(FEET) = 959.79 CHANNEL SLOPE = 0.3843  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.22  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.587  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 82.44 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 221.35  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.98  
AVERAGE FLOW DEPTH(FEET) = 1.19 TRAVEL TIME(MIN.) = 1.07  
Tc(MIN.) = 13.36  
SUBAREA AREA(ACRES) = 82.44 SUBAREA RUNOFF(CFS) = 243.91  
EFFECTIVE AREA(ACRES) = 113.90 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 113.9 PEAK FLOW RATE(CFS) = 337.00  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.51

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.51 FLOW VELOCITY(FEET/SEC.) = 17.09  
LONGEST FLOWPATH FROM NODE 11220.00 TO NODE 11224.00 = 2635.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11224.00 TO NODE 11231.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2370.12 DOWNSTREAM(FEET) = 1794.01  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2223.40 CHANNEL SLOPE = 0.2591  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.93  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.163  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 61.93 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 416.85  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.93  
AVERAGE FLOW DEPTH(FEET) = 1.90 TRAVEL TIME(MIN.) = 2.33  
Tc(MIN.) = 15.68  
SUBAREA AREA(ACRES) = 61.93 SUBAREA RUNOFF(CFS) = 159.59  
EFFECTIVE AREA(ACRES) = 175.83 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 175.8 PEAK FLOW RATE(CFS) = 453.11

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.99

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.99 FLOW VELOCITY(FEET/SEC.) = 16.30  
LONGEST FLOWPATH FROM NODE 11220.00 TO NODE 11231.00 = 4858.40 FEET.

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

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

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11141.00 TO NODE 11141.00 IS CODE = 15.1

-----  
>>>>DEFINE MEMORY BANK # 2 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: S11.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2310.24	13.59	0.30( 0.30)	1.00	792.3	11130.00
2	2268.97	29.31	0.30( 0.30)	1.00	1458.4	11111.00
3	2245.04	30.66	0.30( 0.30)	1.00	1486.7	11101.00
TOTAL AREA(ACRES) =		1486.7				

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11141.00 TO NODE 11141.00 IS CODE = 14.0

-----  
>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<

=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2310.24	13.59	0.30( 0.30)	1.00	792.3	11130.00
2	2268.97	29.31	0.30( 0.30)	1.00	1458.4	11111.00
3	2245.04	30.66	0.30( 0.30)	1.00	1486.7	11101.00
TOTAL AREA(ACRES) =		1486.7				

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11141.00 TO NODE 11231.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1954.20 DOWNSTREAM(FEET) = 1794.01  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1435.64 CHANNEL SLOPE = 0.1116  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.87  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.282  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 89.78 0.30 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2430.74  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 19.12  
 AVERAGE FLOW DEPTH(FEET) = 5.86 TRAVEL TIME(MIN.) = 1.25  
 Tc(MIN.) = 14.84  
 SUBAREA AREA(ACRES) = 89.78 SUBAREA RUNOFF(CFS) = 240.97  
 EFFECTIVE AREA(ACRES) = 882.07 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 1576.4 PEAK FLOW RATE(CFS) = 2367.53  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.78

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 5.78 FLOW VELOCITY(FEET/SEC.) = 19.00  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11231.00 = 17326.65 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11224.00 TO NODE 11231.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2367.53	14.84	3.282	0.30( 0.30)	1.00	882.1	11130.00
2	2340.92	30.58	1.980	0.30( 0.30)	1.00	1548.2	11111.00
3	2334.00	31.93	1.945	0.30( 0.30)	1.00	1576.4	11101.00

LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11231.00 = 17326.65 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	453.11	15.68	3.163	0.30( 0.30)	1.00	175.8	11220.00

LONGEST FLOWPATH FROM NODE 11220.00 TO NODE 11231.00 = 4858.40 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2814.09	14.84	3.282	0.30( 0.30)	1.00	1048.5	11130.00
2	2819.21	15.68	3.163	0.30( 0.30)	1.00	1093.6	11220.00
3	2606.79	30.58	1.980	0.30( 0.30)	1.00	1724.0	11111.00
4	2594.33	31.93	1.945	0.30( 0.30)	1.00	1752.3	11101.00

TOTAL AREA(ACRES) = 1752.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 2819.21 Tc(MIN.) = 15.682  
 EFFECTIVE AREA(ACRES) = 1093.58 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 1752.3  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11231.00 = 17326.65 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11231.00 TO NODE 11241.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1794.01 DOWNSTREAM(FEET) = 1680.94  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1933.84 CHANNEL SLOPE = 0.0585  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 7.41  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.906  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	59.78	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2889.31  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.73  
 AVERAGE FLOW DEPTH(FEET) = 7.40 TRAVEL TIME(MIN.) = 2.05  
 Tc(MIN.) = 17.73  
 SUBAREA AREA(ACRES) = 59.78 SUBAREA RUNOFF(CFS) = 140.19  
 EFFECTIVE AREA(ACRES) = 1153.36 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 1812.1 PEAK FLOW RATE(CFS) = 2819.21  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 7.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 7.32 FLOW VELOCITY(FEET/SEC.) = 15.63  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11241.00 = 19260.49 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11231.00 TO NODE 11241.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 17.73  
 RAINFALL INTENSITY(INCH/HR) = 2.91  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 1153.36  
 TOTAL STREAM AREA(ACRES) = 1812.05  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 2819.21

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11201.00 TO NODE 11202.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 986.34  
 ELEVATION DATA: UPSTREAM(FEET) = 3383.22 DOWNSTREAM(FEET) = 3248.87

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.343

\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 4.002  
 SUBAREA Tc AND LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
 PUBLIC PARK - 8.54 0.30 1.000 0 11.34  
 SUBAREA AVERAGE Pervious LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE Pervious AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF (CFS) = 28.45  
 TOTAL AREA (ACRES) = 8.54 PEAK FLOW RATE (CFS) = 28.45

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11202.00 TO NODE 11203.00 IS CODE = 56  
 -----

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<  
 >>>> TRAVELTIME THRU SUBAREA <<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 3248.87 DOWNSTREAM (FEET) = 3198.08  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 922.69 CHANNEL SLOPE = 0.0550  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\* ESTIMATED CHANNEL HEIGHT (FEET) = 1.07  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.388  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 24.42 0.30 1.000 -  
 SUBAREA AVERAGE Pervious LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE Pervious AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 62.59  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.16  
 AVERAGE FLOW DEPTH (FEET) = 1.01 TRAVEL TIME (MIN.) = 2.98  
 Tc (MIN.) = 14.33  
 SUBAREA AREA (ACRES) = 24.42 SUBAREA RUNOFF (CFS) = 67.87  
 EFFECTIVE AREA (ACRES) = 32.96 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 33.0 PEAK FLOW RATE (CFS) = 91.60  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \* ESTIMATED CHANNEL HEIGHT (FEET) = 1.26

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.26 FLOW VELOCITY (FEET/SEC.) = 5.83  
 LONGEST FLOWPATH FROM NODE 11201.00 TO NODE 11203.00 = 1909.03 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11203.00 TO NODE 11204.00 IS CODE = 56  
 -----

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<  
 >>>> TRAVELTIME THRU SUBAREA <<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 3198.08 DOWNSTREAM (FEET) = 3062.48  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1941.08 CHANNEL SLOPE = 0.0699  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\* ESTIMATED CHANNEL HEIGHT (FEET) = 1.52  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.763  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 37.67 0.30 1.000 -  
 SUBAREA AVERAGE Pervious LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE Pervious AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 133.57  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.13  
 AVERAGE FLOW DEPTH (FEET) = 1.45 TRAVEL TIME (MIN.) = 4.54  
 Tc (MIN.) = 18.87  
 SUBAREA AREA (ACRES) = 37.67 SUBAREA RUNOFF (CFS) = 83.50  
 EFFECTIVE AREA (ACRES) = 70.63 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 70.6 PEAK FLOW RATE (CFS) = 156.55  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \* ESTIMATED CHANNEL HEIGHT (FEET) = 1.59

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.59 FLOW VELOCITY (FEET/SEC.) = 7.47  
 LONGEST FLOWPATH FROM NODE 11201.00 TO NODE 11204.00 = 3850.11 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11204.00 TO NODE 11205.00 IS CODE = 56  
 -----

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<  
 >>>> TRAVELTIME THRU SUBAREA <<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 3062.48 DOWNSTREAM (FEET) = 2940.56  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1916.73 CHANNEL SLOPE = 0.0636  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\* ESTIMATED CHANNEL HEIGHT (FEET) = 1.84  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.390  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 34.87 0.30 1.000 -  
 SUBAREA AVERAGE Pervious LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE Pervious AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 189.39  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.68  
 AVERAGE FLOW DEPTH (FEET) = 1.81 TRAVEL TIME (MIN.) = 4.16  
 Tc (MIN.) = 23.03  
 SUBAREA AREA (ACRES) = 34.87 SUBAREA RUNOFF (CFS) = 65.59  
 EFFECTIVE AREA (ACRES) = 105.50 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 105.5 PEAK FLOW RATE (CFS) = 198.45  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \* ESTIMATED CHANNEL HEIGHT (FEET) = 1.86

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.86 FLOW VELOCITY (FEET/SEC.) = 7.78  
 LONGEST FLOWPATH FROM NODE 11201.00 TO NODE 11205.00 = 5766.84 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11205.00 TO NODE 11206.00 IS CODE = 56  
 -----

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2940.56 DOWNSTREAM(FEET) = 2581.93  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2865.58 CHANNEL SLOPE = 0.1252  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.76

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.114

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	56.17	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 244.34

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.50

AVERAGE FLOW DEPTH(FEET) = 1.73 TRAVEL TIME(MIN.) = 4.55

Tc(MIN.) = 27.57

SUBAREA AREA(ACRES) = 56.17 SUBAREA RUNOFF(CFS) = 91.70

EFFECTIVE AREA(ACRES) = 161.67 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 161.7 PEAK FLOW RATE(CFS) = 263.93

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.80

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.80 FLOW VELOCITY(FEET/SEC.) = 10.76

LONGEST FLOWPATH FROM NODE 11201.00 TO NODE 11206.00 = 8632.42 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11206.00 TO NODE 11207.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2581.93 DOWNSTREAM(FEET) = 2317.20  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1985.44 CHANNEL SLOPE = 0.1333

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.02

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.002

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	546.87	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 683.05

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.47

AVERAGE FLOW DEPTH(FEET) = 2.96 TRAVEL TIME(MIN.) = 2.29

Tc(MIN.) = 29.86

SUBAREA AREA(ACRES) = 546.87 SUBAREA RUNOFF(CFS) = 837.64

EFFECTIVE AREA(ACRES) = 708.54 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 708.5 PEAK FLOW RATE(CFS) = 1085.27

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.76

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.76 FLOW VELOCITY(FEET/SEC.) = 16.48

LONGEST FLOWPATH FROM NODE 11201.00 TO NODE 11207.00 = 10617.86 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11207.00 TO NODE 11241.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2317.20 DOWNSTREAM(FEET) = 1680.94

CHANNEL LENGTH THRU SUBAREA(FEET) = 4085.95 CHANNEL SLOPE = 0.1557

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.09

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.904

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	389.75	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1366.56

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 18.55

AVERAGE FLOW DEPTH(FEET) = 4.06 TRAVEL TIME(MIN.) = 3.67

Tc(MIN.) = 33.53

SUBAREA AREA(ACRES) = 389.75 SUBAREA RUNOFF(CFS) = 562.50

EFFECTIVE AREA(ACRES) = 1098.29 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1098.3 PEAK FLOW RATE(CFS) = 1585.10

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.38

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 4.38 FLOW VELOCITY(FEET/SEC.) = 19.31

LONGEST FLOWPATH FROM NODE 11201.00 TO NODE 11241.00 = 14703.81 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11207.00 TO NODE 11241.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 33.53

RAINFALL INTENSITY(INCH/HR) = 1.90

AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA(ACRES) = 1098.29

TOTAL STREAM AREA(ACRES) = 1098.29

PEAK FLOW RATE(CFS) AT CONFLUENCE = 1585.10

\*\* CONFLUENCE DATA \*\*



STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2814.09	16.89	3.012	0.30( 0.30)	1.00	1108.2	11130.00
1	2819.21	17.73	2.906	0.30( 0.30)	1.00	1153.4	11220.00
1	2610.15	32.67	1.926	0.30( 0.30)	1.00	1783.8	11111.00
1	2594.33	34.03	1.891	0.30( 0.30)	1.00	1812.1	11101.00
2	1585.10	33.53	1.904	0.30( 0.30)	1.00	1098.3	11201.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4163.96	16.89	3.012	0.30( 0.30)	1.00	1661.3	11130.00
2	4181.06	17.73	2.906	0.30( 0.30)	1.00	1734.1	11220.00
3	4176.06	32.67	1.926	0.30( 0.30)	1.00	2853.9	11111.00
4	4185.21	33.53	1.904	0.30( 0.30)	1.00	2900.0	11201.00
5	4166.73	34.03	1.891	0.30( 0.30)	1.00	2910.3	11101.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 4185.21 Tc(MIN.) = 33.53  
EFFECTIVE AREA(ACRES) = 2900.00 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 2910.3  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11241.00 = 19260.49 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11241.00 TO NODE 11242.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1680.94 DOWNSTREAM(FEET) = 1521.21  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1795.61 CHANNEL SLOPE = 0.0890  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.10  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.866

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	198.62	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4325.15  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 20.39  
AVERAGE FLOW DEPTH(FEET) = 8.10 TRAVEL TIME(MIN.) = 1.47  
Tc(MIN.) = 35.00  
SUBAREA AREA(ACRES) = 198.62 SUBAREA RUNOFF(CFS) = 279.86  
EFFECTIVE AREA(ACRES) = 3098.62 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 3109.0 PEAK FLOW RATE(CFS) = 4366.04  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.13

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.13 FLOW VELOCITY(FEET/SEC.) = 20.45  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11242.00 = 21056.10 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11242.00 TO NODE 11261.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1521.21 DOWNSTREAM(FEET) = 1343.95  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2223.33 CHANNEL SLOPE = 0.0797  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.40  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.817

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	95.39	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4431.15  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 19.70  
AVERAGE FLOW DEPTH(FEET) = 8.40 TRAVEL TIME(MIN.) = 1.88  
Tc(MIN.) = 36.88

SUBAREA AREA(ACRES) = 95.39 SUBAREA RUNOFF(CFS) = 130.23  
EFFECTIVE AREA(ACRES) = 3194.01 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 3204.3 PEAK FLOW RATE(CFS) = 4366.04

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.34

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.34 FLOW VELOCITY(FEET/SEC.) = 19.64  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11261.00 = 23279.43 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11242.00 TO NODE 11261.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 36.88  
RAINFALL INTENSITY(INCH/HR) = 1.82  
AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 3194.01  
TOTAL STREAM AREA(ACRES) = 3204.35  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 4366.04

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11250.00 TO NODE 11251.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH (FEET) = 982.50  
ELEVATION DATA: UPSTREAM (FEET) = 3806.44 DOWNSTREAM (FEET) = 3168.25

Tc = K \* [(LENGTH\*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20  
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 12.112  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.843  
SUBAREA Tc AND LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL, BROADLEAF" - 5.91 0.30 1.000 0 12.11  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF (CFS) = 18.85  
TOTAL AREA (ACRES) = 5.91 PEAK FLOW RATE (CFS) = 18.85

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11251.00 TO NODE 11252.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 3168.25 DOWNSTREAM (FEET) = 2683.24  
CHANNEL LENGTH THRU SUBAREA (FEET) = 925.62 CHANNEL SLOPE = 0.5240  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\* ESTIMATED CHANNEL HEIGHT (FEET) = 0.41  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.494  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 13.73 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 38.62  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.09  
AVERAGE FLOW DEPTH (FEET) = 0.39 TRAVEL TIME (MIN.) = 1.70  
Tc (MIN.) = 13.81  
SUBAREA AREA (ACRES) = 13.73 SUBAREA RUNOFF (CFS) = 39.47  
EFFECTIVE AREA (ACRES) = 19.64 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 19.6 PEAK FLOW RATE (CFS) = 56.46  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\* ESTIMATED CHANNEL HEIGHT (FEET) = 0.49

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.49 FLOW VELOCITY (FEET/SEC.) = 10.42  
LONGEST FLOWPATH FROM NODE 11250.00 TO NODE 11252.00 = 1908.12 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11252.00 TO NODE 11253.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 2683.24 DOWNSTREAM (FEET) = 2334.26  
CHANNEL LENGTH THRU SUBAREA (FEET) = 944.66 CHANNEL SLOPE = 0.3694  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\* ESTIMATED CHANNEL HEIGHT (FEET) = 0.91  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.239

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 55.67 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 130.17  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.42  
AVERAGE FLOW DEPTH (FEET) = 0.89 TRAVEL TIME (MIN.) = 1.27  
Tc (MIN.) = 15.08  
SUBAREA AREA (ACRES) = 55.67 SUBAREA RUNOFF (CFS) = 147.27  
EFFECTIVE AREA (ACRES) = 75.31 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 75.3 PEAK FLOW RATE (CFS) = 199.23  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\* ESTIMATED CHANNEL HEIGHT (FEET) = 1.13

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.13 FLOW VELOCITY (FEET/SEC.) = 14.32  
LONGEST FLOWPATH FROM NODE 11250.00 TO NODE 11253.00 = 2852.78 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11253.00 TO NODE 11254.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 2334.26 DOWNSTREAM (FEET) = 1768.11  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2293.59 CHANNEL SLOPE = 0.2468  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\* ESTIMATED CHANNEL HEIGHT (FEET) = 1.93  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.927

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 165.43 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 395.18  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 15.42  
AVERAGE FLOW DEPTH (FEET) = 1.87 TRAVEL TIME (MIN.) = 2.48  
Tc (MIN.) = 17.56  
SUBAREA AREA (ACRES) = 165.43 SUBAREA RUNOFF (CFS) = 391.20  
EFFECTIVE AREA (ACRES) = 240.74 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 240.7 PEAK FLOW RATE (CFS) = 569.29  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\* ESTIMATED CHANNEL HEIGHT (FEET) = 2.28

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.28 FLOW VELOCITY(FEET/SEC.) = 17.17  
 LONGEST FLOWPATH FROM NODE 11250.00 TO NODE 11254.00 = 5146.37 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11254.00 TO NODE 11255.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1768.11 DOWNSTREAM(FEET) = 1506.97  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1897.59 CHANNEL SLOPE = 0.1376  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.19

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.665

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	194.55	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 776.59

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.19

AVERAGE FLOW DEPTH(FEET) = 3.14 TRAVEL TIME(MIN.) = 2.08

Tc(MIN.) = 19.64

SUBAREA AREA(ACRES) = 194.55 SUBAREA RUNOFF(CFS) = 414.20

EFFECTIVE AREA(ACRES) = 435.29 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 435.3 PEAK FLOW RATE(CFS) = 926.73

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.44

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.44 FLOW VELOCITY(FEET/SEC.) = 15.94

LONGEST FLOWPATH FROM NODE 11250.00 TO NODE 11255.00 = 7043.96 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11255.00 TO NODE 11261.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1506.97 DOWNSTREAM(FEET) = 1343.95  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 882.10 CHANNEL SLOPE = 0.1848  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.44

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.587

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	137.86	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1068.62

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 18.48

AVERAGE FLOW DEPTH(FEET) = 3.43 TRAVEL TIME(MIN.) = 0.80

Tc(MIN.) = 20.43

SUBAREA AREA(ACRES) = 137.86 SUBAREA RUNOFF(CFS) = 283.77

EFFECTIVE AREA(ACRES) = 573.15 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 573.1 PEAK FLOW RATE(CFS) = 1179.75

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.61

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.61 FLOW VELOCITY(FEET/SEC.) = 18.97

LONGEST FLOWPATH FROM NODE 11250.00 TO NODE 11261.00 = 7926.06 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11255.00 TO NODE 11261.00 IS CODE = 1

-----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 20.43

RAINFALL INTENSITY(INCH/HR) = 2.59

AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA(ACRES) = 573.15

TOTAL STREAM AREA(ACRES) = 573.15

PEAK FLOW RATE(CFS) AT CONFLUENCE = 1179.75

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4231.58	20.24	2.602	0.30( 0.30)	1.00	1955.3	11130.00
1	4212.52	21.09	2.537	0.30( 0.30)	1.00	2028.1	11220.00
1	4362.25	36.02	1.839	0.30( 0.30)	1.00	3147.9	11111.00
1	4366.04	36.88	1.817	0.30( 0.30)	1.00	3194.0	11201.00
1	4344.64	37.38	1.804	0.30( 0.30)	1.00	3204.3	11101.00
2	1179.75	20.43	2.587	0.30( 0.30)	1.00	573.1	11250.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5407.64	20.24	2.602	0.30( 0.30)	1.00	2523.0	11130.00
2	5406.94	20.43	2.587	0.30( 0.30)	1.00	2545.2	11250.00
3	5366.71	21.09	2.537	0.30( 0.30)	1.00	2601.3	11220.00
4	5156.20	36.02	1.839	0.30( 0.30)	1.00	3721.1	11111.00
5	5148.49	36.88	1.817	0.30( 0.30)	1.00	3767.2	11201.00
6	5120.45	37.38	1.804	0.30( 0.30)	1.00	3777.5	11101.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 5407.64 Tc(MIN.) = 20.24

EFFECTIVE AREA(ACRES) = 2523.02 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 3777.5  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11261.00 = 23279.43 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11261.00 TO NODE 11310.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1343.95 DOWNSTREAM(FEET) = 1299.17  
CHANNEL LENGTH THRU SUBAREA(FEET) = 889.38 CHANNEL SLOPE = 0.0503  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.26

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.538

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
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USER-DEFINED	-	79.65	0.30	1.000	-
--------------	---	-------	------	-------	---

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5487.84

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 17.53

AVERAGE FLOW DEPTH(FEET) = 10.26 TRAVEL TIME(MIN.) = 0.85

Tc(MIN.) = 21.08

SUBAREA AREA(ACRES) = 79.65 SUBAREA RUNOFF(CFS) = 160.40

EFFECTIVE AREA(ACRES) = 2602.67 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 3857.1 PEAK FLOW RATE(CFS) = 5407.64

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.19

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 10.19 FLOW VELOCITY(FEET/SEC.) = 17.47

LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11310.00 = 24168.81 FEET.

-----  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 3857.1 TC(MIN.) = 21.08

EFFECTIVE AREA(ACRES) = 2602.67 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.000

PEAK FLOW RATE(CFS) = 5407.64

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5407.64	21.08	2.538	0.30( 0.30)	1.00	2602.7	11130.00
2	5406.94	21.28	2.523	0.30( 0.30)	1.00	2624.9	11250.00
3	5366.71	21.93	2.473	0.30( 0.30)	1.00	2680.9	11220.00
4	5189.01	36.88	1.817	0.30( 0.30)	1.00	3800.7	11111.00
5	5174.77	37.74	1.795	0.30( 0.30)	1.00	3846.8	11201.00
6	5143.78	38.24	1.782	0.30( 0.30)	1.00	3857.1	11101.00

-----  
END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

-----  
FILE NAME: S13.DAT  
TIME/DATE OF STUDY: 09:58 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.868
- 2) 10.00; 4.278
- 3) 15.00; 3.249
- 4) 20.00; 2.620
- 5) 25.00; 2.240
- 6) 30.00; 1.995
- 7) 40.00; 1.736
- 8) 50.00; 1.482
- 9) 60.00; 1.420
- 10) 90.00; 1.225
- 11) 120.00; 1.092
- 12) 180.00; 0.931
- 13) 360.00; 0.714
- 14) 1440.00; 0.320

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11300.00 TO NODE 11301.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 455.90  
ELEVATION DATA: UPSTREAM(FEET) = 3394.67 DOWNSTREAM(FEET) = 3247.06

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.240  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.229

SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 2.53 0.30 1.000 0 10.24  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 8.95  
TOTAL AREA(ACRES) = 2.53 PEAK FLOW RATE(CFS) = 8.95

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11301.00 TO NODE 11301.50 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3247.06 DOWNSTREAM(FEET) = 3150.57  
CHANNEL LENGTH THRU SUBAREA(FEET) = 468.69 CHANNEL SLOPE = 0.2059  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.43  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.956

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN  
USER-DEFINED - 10.95 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 26.99  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.89  
AVERAGE FLOW DEPTH(FEET) = 0.42 TRAVEL TIME(MIN.) = 1.33  
Tc(MIN.) = 11.57  
SUBAREA AREA(ACRES) = 10.95 SUBAREA RUNOFF(CFS) = 36.03  
EFFECTIVE AREA(ACRES) = 13.48 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 13.5 PEAK FLOW RATE(CFS) = 44.35  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.56

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.56 FLOW VELOCITY(FEET/SEC.) = 7.10  
LONGEST FLOWPATH FROM NODE 11300.00 TO NODE 11301.50 = 924.59 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11301.50 TO NODE 11302.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3150.57 DOWNSTREAM(FEET) = 2840.04  
CHANNEL LENGTH THRU SUBAREA(FEET) = 982.20 CHANNEL SLOPE = 0.3162  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.59

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.580

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	9.59	0.30	1.000	-

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 58.53

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.96

AVERAGE FLOW DEPTH(FEET) = 0.58 TRAVEL TIME(MIN.) = 1.83

Tc(MIN.) = 13.39

SUBAREA AREA(ACRES) = 9.59 SUBAREA RUNOFF(CFS) = 28.31

EFFECTIVE AREA(ACRES) = 23.07 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 23.1 PEAK FLOW RATE(CFS) = 68.10

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.64

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.64 FLOW VELOCITY(FEET/SEC.) = 9.47

LONGEST FLOWPATH FROM NODE 11300.00 TO NODE 11302.00 = 1906.79 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11302.00 TO NODE 11303.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2840.04 DOWNSTREAM(FEET) = 2177.16  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1916.03 CHANNEL SLOPE = 0.3460  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.13

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.152

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	84.31	0.30	1.000	-

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 176.65

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.44

AVERAGE FLOW DEPTH(FEET) = 1.08 TRAVEL TIME(MIN.) = 2.38

Tc(MIN.) = 15.77

SUBAREA AREA(ACRES) = 84.31 SUBAREA RUNOFF(CFS) = 216.44

EFFECTIVE AREA(ACRES) = 107.38 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 107.4 PEAK FLOW RATE(CFS) = 275.67

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.39

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.39 FLOW VELOCITY(FEET/SEC.) = 15.50

LONGEST FLOWPATH FROM NODE 11300.00 TO NODE 11303.00 = 3822.82 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11303.00 TO NODE 11304.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2177.16 DOWNSTREAM(FEET) = 1612.27  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2472.34 CHANNEL SLOPE = 0.2285  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.93

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.805

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	99.61	0.30	1.000	-

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 388.09

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.91

AVERAGE FLOW DEPTH(FEET) = 1.89 TRAVEL TIME(MIN.) = 2.76

Tc(MIN.) = 18.53

SUBAREA AREA(ACRES) = 99.61 SUBAREA RUNOFF(CFS) = 224.55

EFFECTIVE AREA(ACRES) = 206.99 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 207.0 PEAK FLOW RATE(CFS) = 466.62

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.09

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.09 FLOW VELOCITY(FEET/SEC.) = 15.71

LONGEST FLOWPATH FROM NODE 11300.00 TO NODE 11304.00 = 6295.16 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11304.00 TO NODE 11320.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1612.27 DOWNSTREAM(FEET) = 1222.10  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2432.96 CHANNEL SLOPE = 0.1604  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.46

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.517

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	53.86	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 520.36  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 14.34  
 AVERAGE FLOW DEPTH( FEET) = 2.44 TRAVEL TIME( MIN.) = 2.83  
 Tc( MIN.) = 21.36  
 SUBAREA AREA( ACRES) = 53.86 SUBAREA RUNOFF( CFS) = 107.46  
 EFFECTIVE AREA( ACRES) = 260.85 AREA-AVERAGED Fm( INCH/HR) = 0.30  
 AREA-AVERAGED Fp( INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA( ACRES) = 260.8 PEAK FLOW RATE( CFS) = 520.43  
 GIVEN CHANNEL BASE( FEET) = 10.00 CHANNEL FREEBOARD( FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT( FEET) = 2.44

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH( FEET) = 2.44 FLOW VELOCITY( FEET/SEC.) = 14.35  
 LONGEST FLOWPATH FROM NODE 11300.00 TO NODE 11320.00 = 8728.12 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11304.00 TO NODE 11320.00 IS CODE = 10  
 -----

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

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11261.00 TO NODE 11310.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 2 <<<<<  
 =====

PEAK FLOWRATE TABLE FILE NAME: S12.DNA  
 MEMORY BANK # 2 DEFINED AS FOLLOWS:  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5407.64	21.08	0.30 ( 0.30)	1.00	2602.7	11130.00
2	5406.94	21.28	0.30 ( 0.30)	1.00	2624.9	11250.00
3	5366.71	21.93	0.30 ( 0.30)	1.00	2680.9	11220.00
4	5189.01	36.88	0.30 ( 0.30)	1.00	3800.7	11111.00
5	5174.77	37.74	0.30 ( 0.30)	1.00	3846.8	11201.00
6	5143.78	38.24	0.30 ( 0.30)	1.00	3857.1	11101.00
TOTAL AREA( ACRES) =						3857.1

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11261.00 TO NODE 11310.00 IS CODE = 14.0  
 -----

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
 =====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5407.64	21.08	0.30 ( 0.30)	1.00	2602.7	11130.00
2	5406.94	21.28	0.30 ( 0.30)	1.00	2624.9	11250.00
3	5366.71	21.93	0.30 ( 0.30)	1.00	2680.9	11220.00
4	5189.01	36.88	0.30 ( 0.30)	1.00	3800.7	11111.00
5	5174.77	37.74	0.30 ( 0.30)	1.00	3846.8	11201.00
6	5143.78	38.24	0.30 ( 0.30)	1.00	3857.1	11101.00
TOTAL AREA( ACRES) =						3857.1

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11310.00 TO NODE 11320.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM( FEET) = 1299.17 DOWNSTREAM( FEET) = 1222.10  
 CHANNEL LENGTH THRU SUBAREA( FEET) = 1694.05 CHANNEL SLOPE = 0.0455  
 GIVEN CHANNEL BASE( FEET) = 10.00 CHANNEL FREEBOARD( FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT( FEET) = 10.50  
 \* 100 YEAR RAINFALL INTENSITY( INCH/HR) = 2.410  
 SUBAREA LOSS RATE DATA( AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	83.22	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5486.68  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 16.87  
 AVERAGE FLOW DEPTH( FEET) = 10.49 TRAVEL TIME( MIN.) = 1.67  
 Tc( MIN.) = 22.76  
 SUBAREA AREA( ACRES) = 83.22 SUBAREA RUNOFF( CFS) = 158.07  
 EFFECTIVE AREA( ACRES) = 2685.89 AREA-AVERAGED Fm( INCH/HR) = 0.30  
 AREA-AVERAGED Fp( INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA( ACRES) = 3940.4 PEAK FLOW RATE( CFS) = 5407.64  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE( FEET) = 10.00 CHANNEL FREEBOARD( FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT( FEET) = 10.42

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH( FEET) = 10.42 FLOW VELOCITY( FEET/SEC.) = 16.82  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11320.00 = 25862.86 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11304.00 TO NODE 11320.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<  
 =====

\*\* MAIN STREAM CONFLUENCE DATA \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5407.64	22.76	2.410	0.30 ( 0.30)	1.00	2685.9	11130.00
2	5406.94	22.95	2.396	0.30 ( 0.30)	1.00	2708.1	11250.00
3	5366.71	23.61	2.346	0.30 ( 0.30)	1.00	2764.1	11220.00
4	5189.01	38.57	1.773	0.30 ( 0.30)	1.00	3884.0	11111.00
5	5174.77	39.43	1.751	0.30 ( 0.30)	1.00	3930.0	11201.00
6	5143.78	39.93	1.738	0.30 ( 0.30)	1.00	3940.4	11101.00
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11320.00 =							25862.86 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	520.43	21.36	2.517	0.30 ( 0.30)	1.00	260.8	11300.00
LONGEST FLOWPATH FROM NODE 11300.00 TO NODE 11320.00 =							8728.12 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5851.31	21.36	2.517	0.30( 0.30)	1.00	2781.6	11300.00
2	5903.10	22.76	2.410	0.30( 0.30)	1.00	2946.7	11130.00
3	5898.92	22.95	2.396	0.30( 0.30)	1.00	2969.0	11250.00
4	5846.98	23.61	2.346	0.30( 0.30)	1.00	3025.0	11220.00
5	5534.85	38.57	1.773	0.30( 0.30)	1.00	4144.8	11111.00
6	5515.38	39.43	1.751	0.30( 0.30)	1.00	4190.9	11201.00
7	5481.33	39.93	1.738	0.30( 0.30)	1.00	4201.2	11101.00
TOTAL AREA (ACRES) =		4201.2					

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 5903.10 Tc(MIN.) = 22.758  
 EFFECTIVE AREA(ACRES) = 2946.74 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 4201.2  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11320.00 = 25862.86 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11320.00 TO NODE 11340.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1222.10 DOWNSTREAM(FEET) = 1092.58  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 3157.19 CHANNEL SLOPE = 0.0410  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 11.36  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.196  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
USER-DEFINED	-	328.55	0.30	1.000	-	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6183.45  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.74  
 AVERAGE FLOW DEPTH(FEET) = 11.32 TRAVEL TIME(MIN.) = 3.14  
 Tc(MIN.) = 25.90  
 SUBAREA AREA(ACRES) = 328.55 SUBAREA RUNOFF(CFS) = 560.60  
 EFFECTIVE AREA(ACRES) = 3275.29 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 4529.8 PEAK FLOW RATE(CFS) = 5903.10  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 11.09

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 11.09 FLOW VELOCITY(FEET/SEC.) = 16.54  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11340.00 = 29020.05 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11320.00 TO NODE 11340.00 IS CODE = 1  
 -----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 25.90  
 RAINFALL INTENSITY(INCH/HR) = 2.20  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 3275.29  
 TOTAL STREAM AREA(ACRES) = 4529.77  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 5903.10

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11330.00 TO NODE 11331.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

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

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.975  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.327  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	-	1.69	0.30	1.000	0	7.98

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 7.65  
 TOTAL AREA(ACRES) = 1.69 PEAK FLOW RATE(CFS) = 7.65

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11331.00 TO NODE 11332.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3123.64 DOWNSTREAM(FEET) = 2903.10  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 710.41 CHANNEL SLOPE = 0.3104  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.32  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.277  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
USER-DEFINED	-	5.82	0.30	1.000	-	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.20  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.83  
 AVERAGE FLOW DEPTH(FEET) = 0.29 TRAVEL TIME(MIN.) = 2.03  
 Tc(MIN.) = 10.00  
 SUBAREA AREA(ACRES) = 5.82 SUBAREA RUNOFF(CFS) = 20.83  
 EFFECTIVE AREA(ACRES) = 7.51 AREA-AVERAGED Fm(INCH/HR) = 0.30



AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 7.5 PEAK FLOW RATE(CFS) = 26.88  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.37

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.37 FLOW VELOCITY(FEET/SEC.) = 6.75  
LONGEST FLOWPATH FROM NODE 11330.00 TO NODE 11332.00 = 1010.24 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11332.00 TO NODE 11333.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2903.10 DOWNSTREAM(FEET) = 2718.89  
CHANNEL LENGTH THRU SUBAREA(FEET) = 843.93 CHANNEL SLOPE = 0.2183  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.55  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.870  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	9.66	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 42.42  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.11  
AVERAGE FLOW DEPTH(FEET) = 0.54 TRAVEL TIME(MIN.) = 1.98  
Tc(MIN.) = 11.98

SUBAREA AREA(ACRES) = 9.66 SUBAREA RUNOFF(CFS) = 31.04  
EFFECTIVE AREA(ACRES) = 17.17 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 17.2 PEAK FLOW RATE(CFS) = 55.16  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.63

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.63 FLOW VELOCITY(FEET/SEC.) = 7.80  
LONGEST FLOWPATH FROM NODE 11330.00 TO NODE 11333.00 = 1854.17 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11333.00 TO NODE 11334.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2718.89 DOWNSTREAM(FEET) = 2364.84  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1084.60 CHANNEL SLOPE = 0.3264  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.66  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.488  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	9.66	0.30	1.000	-

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 11.67 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 71.93  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.74  
AVERAGE FLOW DEPTH(FEET) = 0.65 TRAVEL TIME(MIN.) = 1.86  
Tc(MIN.) = 13.84  
SUBAREA AREA(ACRES) = 11.67 SUBAREA RUNOFF(CFS) = 33.48  
EFFECTIVE AREA(ACRES) = 28.84 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 28.8 PEAK FLOW RATE(CFS) = 82.74  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.71

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.71 FLOW VELOCITY(FEET/SEC.) = 10.26  
LONGEST FLOWPATH FROM NODE 11330.00 TO NODE 11334.00 = 2938.77 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11334.00 TO NODE 11335.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2364.84 DOWNSTREAM(FEET) = 1729.46  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1963.08 CHANNEL SLOPE = 0.3237  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.28  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.100  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	102.74	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 212.55  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.96  
AVERAGE FLOW DEPTH(FEET) = 1.22 TRAVEL TIME(MIN.) = 2.34  
Tc(MIN.) = 16.18

SUBAREA AREA(ACRES) = 102.74 SUBAREA RUNOFF(CFS) = 258.91  
EFFECTIVE AREA(ACRES) = 131.58 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 131.6 PEAK FLOW RATE(CFS) = 331.59  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.57

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.57 FLOW VELOCITY(FEET/SEC.) = 16.02  
LONGEST FLOWPATH FROM NODE 11330.00 TO NODE 11335.00 = 4901.85 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11335.00 TO NODE 11340.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1729.46 DOWNSTREAM(FEET) = 1092.58  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2702.07 CHANNEL SLOPE = 0.2357  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.02  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.735  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 90.38 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 430.81  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.52  
AVERAGE FLOW DEPTH(FEET) = 1.99 TRAVEL TIME(MIN.) = 2.90  
Tc(MIN.) = 19.09  
SUBAREA AREA(ACRES) = 90.38 SUBAREA RUNOFF(CFS) = 198.07  
EFFECTIVE AREA(ACRES) = 221.96 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 222.0 PEAK FLOW RATE(CFS) = 486.43  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.12

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.12 FLOW VELOCITY(FEET/SEC.) = 16.13  
LONGEST FLOWPATH FROM NODE 11330.00 TO NODE 11340.00 = 7603.92 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11335.00 TO NODE 11340.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION(MIN.) = 19.09  
RAINFALL INTENSITY(INCH/HR) = 2.73  
AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 221.96  
TOTAL STREAM AREA(ACRES) = 221.96  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 486.43

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5851.31	24.51	2.277	0.30( 0.30)	1.00	3110.1	11300.00
1	5903.10	25.90	2.196	0.30( 0.30)	1.00	3275.3	11130.00
1	5898.92	26.10	2.186	0.30( 0.30)	1.00	3297.5	11250.00
1	5846.98	26.76	2.154	0.30( 0.30)	1.00	3353.5	11220.00
1	5600.44	41.77	1.691	0.30( 0.30)	1.00	4473.4	11111.00
1	5568.74	42.64	1.669	0.30( 0.30)	1.00	4519.4	11201.00
1	5528.88	43.15	1.656	0.30( 0.30)	1.00	4529.8	11101.00
2	486.43	19.09	2.735	0.30( 0.30)	1.00	222.0	11330.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6097.70	19.09	2.735	0.30( 0.30)	1.00	2644.1	11330.00
2	6246.34	24.51	2.277	0.30( 0.30)	1.00	3332.1	11300.00
3	6281.83	25.90	2.196	0.30( 0.30)	1.00	3497.2	11130.00
4	6275.72	26.10	2.186	0.30( 0.30)	1.00	3519.5	11250.00
5	6217.31	26.76	2.154	0.30( 0.30)	1.00	3575.5	11220.00
6	5878.33	41.77	1.691	0.30( 0.30)	1.00	4695.3	11111.00
7	5842.23	42.64	1.669	0.30( 0.30)	1.00	4741.4	11201.00
8	5799.80	43.15	1.656	0.30( 0.30)	1.00	4751.7	11101.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 6281.83 Tc(MIN.) = 25.90  
EFFECTIVE AREA(ACRES) = 3497.25 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 4751.7  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11340.00 = 29020.05 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11340.00 TO NODE 11341.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1092.58 DOWNSTREAM(FEET) = 1055.49  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1432.69 CHANNEL SLOPE = 0.0259  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 12.65  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.113  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 54.55 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6326.34  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.17  
AVERAGE FLOW DEPTH(FEET) = 12.65 TRAVEL TIME(MIN.) = 1.68  
Tc(MIN.) = 27.59  
SUBAREA AREA(ACRES) = 54.55 SUBAREA RUNOFF(CFS) = 89.03  
EFFECTIVE AREA(ACRES) = 3551.80 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 4806.3 PEAK FLOW RATE(CFS) = 6281.83  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 12.61

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 12.61 FLOW VELOCITY(FEET/SEC.) = 14.15  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11341.00 = 30452.74 FEET.

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FLOW PROCESS FROM NODE 11341.00 TO NODE 11342.00 IS CODE = 56
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1055.49 DOWNSTREAM(FEET) = 1017.16
CHANNEL LENGTH THRU SUBAREA(FEET) = 943.89 CHANNEL SLOPE = 0.0406
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 11.51
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.067
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
LAND USE           GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED       -       119.96   0.30   1.000   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6377.24
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.80
AVERAGE FLOW DEPTH(FEET) = 11.50 TRAVEL TIME(MIN.) = 0.94
Tc(MIN.) = 28.52
SUBAREA AREA(ACRES) = 119.96 SUBAREA RUNOFF(CFS) = 190.82
EFFECTIVE AREA(ACRES) = 3671.76 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 4926.2 PEAK FLOW RATE(CFS) = 6281.83
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 11.42

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 11.42 FLOW VELOCITY(FEET/SEC.) = 16.74
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11342.00 = 31396.63 FEET.

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FLOW PROCESS FROM NODE 11342.00 TO NODE 11360.00 IS CODE = 56
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1017.16 DOWNSTREAM(FEET) = 957.53
CHANNEL LENGTH THRU SUBAREA(FEET) = 1557.63 CHANNEL SLOPE = 0.0383
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 11.63
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.992
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
LAND USE           GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED       -       85.25   0.30   0.990   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.990
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6346.87
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.42
AVERAGE FLOW DEPTH(FEET) = 11.62 TRAVEL TIME(MIN.) = 1.58
Tc(MIN.) = 30.10
SUBAREA AREA(ACRES) = 85.25 SUBAREA RUNOFF(CFS) = 130.08

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EFFECTIVE AREA(ACRES) = 3757.01 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 5011.5 PEAK FLOW RATE(CFS) = 6281.83
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 11.57

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 11.57 FLOW VELOCITY(FEET/SEC.) = 16.38
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11360.00 = 32954.26 FEET.

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*****
FLOW PROCESS FROM NODE 11342.00 TO NODE 11360.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 30.10
RAINFALL INTENSITY(INCH/HR) = 1.99
AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 3757.01
TOTAL STREAM AREA(ACRES) = 5011.49
PEAK FLOW RATE(CFS) AT CONFLUENCE = 6281.83

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

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 14.655
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.320
SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS   Tc
LAND USE           GROUP   (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"CHAPARRAL,NARROWLEAF" -       5.40   0.30   1.000   0   14.66
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 14.68
TOTAL AREA(ACRES) = 5.40 PEAK FLOW RATE(CFS) = 14.68

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*****
FLOW PROCESS FROM NODE 11351.00 TO NODE 11352.00 IS CODE = 56
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 2583.16 DOWNSTREAM(FEET) = 2403.73
CHANNEL LENGTH THRU SUBAREA(FEET) = 956.57 CHANNEL SLOPE = 0.1876

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GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.51  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.969  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	15.56	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 33.43  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.20  
 AVERAGE FLOW DEPTH (FEET) = 0.49 TRAVEL TIME (MIN.) = 2.57  
 Tc (MIN.) = 17.23  
 SUBAREA AREA (ACRES) = 15.56 SUBAREA RUNOFF (CFS) = 37.37  
 EFFECTIVE AREA (ACRES) = 20.96 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 21.0 PEAK FLOW RATE (CFS) = 50.35  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.62

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.62 FLOW VELOCITY (FEET/SEC.) = 7.19  
 LONGEST FLOWPATH FROM NODE 11350.00 TO NODE 11352.00 = 1907.11 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11352.00 TO NODE 11353.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 2403.73 DOWNSTREAM (FEET) = 1786.74  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1933.85 CHANNEL SLOPE = 0.3190  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.96  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.624  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	74.05	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 128.12  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.76  
 AVERAGE FLOW DEPTH (FEET) = 0.92 TRAVEL TIME (MIN.) = 2.74  
 Tc (MIN.) = 19.97  
 SUBAREA AREA (ACRES) = 74.05 SUBAREA RUNOFF (CFS) = 154.88  
 EFFECTIVE AREA (ACRES) = 95.01 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 95.0 PEAK FLOW RATE (CFS) = 198.73  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.19

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.19 FLOW VELOCITY (FEET/SEC.) = 13.55

LONGEST FLOWPATH FROM NODE 11350.00 TO NODE 11353.00 = 3840.96 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11353.00 TO NODE 11354.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 1786.74 DOWNSTREAM (FEET) = 1308.39  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2073.35 CHANNEL SLOPE = 0.2307  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.45  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.418  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	41.22	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 238.05  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.87  
 AVERAGE FLOW DEPTH (FEET) = 1.44 TRAVEL TIME (MIN.) = 2.69  
 Tc (MIN.) = 22.65  
 SUBAREA AREA (ACRES) = 41.22 SUBAREA RUNOFF (CFS) = 78.59  
 EFFECTIVE AREA (ACRES) = 136.23 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 136.2 PEAK FLOW RATE (CFS) = 259.72  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.51

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.51 FLOW VELOCITY (FEET/SEC.) = 13.23  
 LONGEST FLOWPATH FROM NODE 11350.00 TO NODE 11354.00 = 5914.31 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11354.00 TO NODE 11360.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 1308.39 DOWNSTREAM (FEET) = 957.53  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2455.49 CHANNEL SLOPE = 0.1429  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.33  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.201  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	201.53	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 432.32  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 13.04  
 AVERAGE FLOW DEPTH (FEET) = 2.28 TRAVEL TIME (MIN.) = 3.14  
 Tc (MIN.) = 25.79

SUBAREA AREA (ACRES) = 201.53 SUBAREA RUNOFF (CFS) = 344.83  
 EFFECTIVE AREA (ACRES) = 337.76 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 337.8 PEAK FLOW RATE (CFS) = 577.92  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.66

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.66 FLOW VELOCITY (FEET/SEC.) = 14.18  
 LONGEST FLOWPATH FROM NODE 11350.00 TO NODE 11360.00 = 8369.80 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11354.00 TO NODE 11360.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION (MIN.) = 25.79  
 RAINFALL INTENSITY (INCH/HR) = 2.20  
 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA (ACRES) = 337.76  
 TOTAL STREAM AREA (ACRES) = 337.76  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 577.92

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6097.70	23.32	2.368	0.30 ( 0.30)	1.00	2903.9	11330.00
1	6246.34	28.72	2.058	0.30 ( 0.30)	1.00	3591.9	11300.00
1	6281.83	30.10	1.992	0.30 ( 0.30)	1.00	3757.0	11130.00
1	6275.72	30.30	1.987	0.30 ( 0.30)	1.00	3779.2	11250.00
1	6217.31	30.97	1.970	0.30 ( 0.30)	1.00	3835.3	11220.00
1	5878.33	46.05	1.582	0.30 ( 0.30)	1.00	4955.1	11111.00
1	5842.23	46.92	1.560	0.30 ( 0.30)	1.00	5001.1	11201.00
1	5799.80	47.43	1.547	0.30 ( 0.30)	1.00	5011.5	11101.00
2	577.92	25.79	2.201	0.30 ( 0.30)	1.00	337.8	11350.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6665.96	23.32	2.368	0.30 ( 0.30)	1.00	3209.2	11330.00
2	6743.83	25.79	2.201	0.30 ( 0.30)	1.00	3557.3	11350.00
3	6780.75	28.72	2.058	0.30 ( 0.30)	1.00	3929.6	11300.00
4	6796.29	30.10	1.992	0.30 ( 0.30)	1.00	4094.8	11130.00
5	6788.61	30.30	1.987	0.30 ( 0.30)	1.00	4117.0	11250.00
6	6724.92	30.97	1.970	0.30 ( 0.30)	1.00	4173.0	11220.00
7	6268.18	46.05	1.582	0.30 ( 0.30)	1.00	5292.8	11111.00
8	6225.35	46.92	1.560	0.30 ( 0.30)	1.00	5338.9	11201.00
9	6178.94	47.43	1.547	0.30 ( 0.30)	1.00	5349.2	11101.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE (CFS) = 6796.29 Tc (MIN.) = 30.10  
 EFFECTIVE AREA (ACRES) = 4094.77 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 5349.2  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11360.00 = 32954.26 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11360.00 TO NODE 11361.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 957.53 DOWNSTREAM (FEET) = 847.62  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2937.03 CHANNEL SLOPE = 0.0374  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 12.15  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.916  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	176.74	0.30	0.977	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.977  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 6925.39  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 16.64  
 AVERAGE FLOW DEPTH (FEET) = 12.14 TRAVEL TIME (MIN.) = 2.94  
 Tc (MIN.) = 33.05

SUBAREA AREA (ACRES) = 176.74 SUBAREA RUNOFF (CFS) = 258.18  
 EFFECTIVE AREA (ACRES) = 4271.51 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 5526.0 PEAK FLOW RATE (CFS) = 6796.29  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 12.04

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 12.04 FLOW VELOCITY (FEET/SEC.) = 16.56  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11361.00 = 35891.29 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11361.00 TO NODE 11362.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 847.62 DOWNSTREAM (FEET) = 738.28  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 3869.90 CHANNEL SLOPE = 0.0283  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 13.08  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.805  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	429.50	0.30	0.995	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.995  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7087.55  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.07  
 AVERAGE FLOW DEPTH(FEET) = 13.04 TRAVEL TIME(MIN.) = 4.28  
 Tc(MIN.) = 37.32  
 SUBAREA AREA(ACRES) = 429.50 SUBAREA RUNOFF(CFS) = 582.48  
 EFFECTIVE AREA(ACRES) = 4701.01 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 5955.5 PEAK FLOW RATE(CFS) = 6796.29  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 12.80

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 12.80 FLOW VELOCITY(FEET/SEC.) = 14.90  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11362.00 = 39761.19 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11362.00 TO NODE 11363.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 738.28 DOWNSTREAM(FEET) = 678.93  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2987.23 CHANNEL SLOPE = 0.0199  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 13.90  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.707  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	125.97	0.30	0.991	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.991  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6876.23  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.11  
 AVERAGE FLOW DEPTH(FEET) = 13.89 TRAVEL TIME(MIN.) = 3.80  
 Tc(MIN.) = 41.12  
 SUBAREA AREA(ACRES) = 125.97 SUBAREA RUNOFF(CFS) = 159.88  
 EFFECTIVE AREA(ACRES) = 4826.98 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 6081.5 PEAK FLOW RATE(CFS) = 6796.29  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 13.82

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 13.82 FLOW VELOCITY(FEET/SEC.) = 13.07  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11363.00 = 42748.42 FEET.

=====

END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 6081.5 TC(MIN.) = 41.12  
 EFFECTIVE AREA(ACRES) = 4826.98 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.998

PEAK FLOW RATE(CFS) = 6796.29

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6665.96	34.38	1.882	0.30( 0.30)	1.00	3941.4	11330.00
2	6743.83	36.83	1.818	0.30( 0.30)	1.00	4289.5	11350.00
3	6780.75	39.74	1.743	0.30( 0.30)	1.00	4661.8	11300.00
4	6796.29	41.12	1.707	0.30( 0.30)	1.00	4827.0	11130.00
5	6788.61	41.32	1.702	0.30( 0.30)	1.00	4849.2	11250.00
6	6724.92	42.02	1.685	0.30( 0.30)	1.00	4905.2	11220.00
7	6268.18	57.30	1.437	0.30( 0.30)	1.00	6025.0	11111.00
8	6225.35	58.20	1.431	0.30( 0.30)	1.00	6071.1	11201.00
9	6178.94	58.73	1.428	0.30( 0.30)	1.00	6081.5	11101.00

=====

END OF RATIONAL METHOD ANALYSIS

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

-----  
FILE NAME: S14.DAT  
TIME/DATE OF STUDY: 09:58 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.780
- 2) 10.00; 4.235
- 3) 15.00; 3.221
- 4) 20.00; 2.602
- 5) 25.00; 2.227
- 6) 30.00; 1.984
- 7) 40.00; 1.726
- 8) 50.00; 1.475
- 9) 60.00; 1.408
- 10) 90.00; 1.213
- 11) 120.00; 1.079
- 12) 180.00; 0.919
- 13) 360.00; 0.703
- 14) 1440.00; 0.315

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*  

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11401.00 TO NODE 11401.50 IS CODE = 21  
-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 313.41  
ELEVATION DATA: UPSTREAM(FEET) = 3384.11 DOWNSTREAM(FEET) = 3232.76

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.137  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.183  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	2.25	0.30	1.000	0	8.14

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 9.89  
TOTAL AREA(ACRES) = 2.25 PEAK FLOW RATE(CFS) = 9.89

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11401.50 TO NODE 11402.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3232.76 DOWNSTREAM(FEET) = 3001.05  
CHANNEL LENGTH THRU SUBAREA(FEET) = 620.75 CHANNEL SLOPE = 0.3733  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.41  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.487  
SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	11.39	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.50  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.57  
AVERAGE FLOW DEPTH(FEET) = 0.39 TRAVEL TIME(MIN.) = 1.37  
Tc(MIN.) = 9.50  
SUBAREA AREA(ACRES) = 11.39 SUBAREA RUNOFF(CFS) = 42.93  
EFFECTIVE AREA(ACRES) = 13.64 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 13.6 PEAK FLOW RATE(CFS) = 51.41  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.52

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.52 FLOW VELOCITY(FEET/SEC.) = 9.03  
LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11402.00 = 934.16 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11402.00 TO NODE 11403.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3001.05 DOWNSTREAM(FEET) = 2787.96  
CHANNEL LENGTH THRU SUBAREA(FEET) = 962.99 CHANNEL SLOPE = 0.2213  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.89

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.992

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	26.43	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 95.40

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.47

AVERAGE FLOW DEPTH(FEET) = 0.86 TRAVEL TIME(MIN.) = 1.69

Tc(MIN.) = 11.20

SUBAREA AREA(ACRES) = 26.43 SUBAREA RUNOFF(CFS) = 87.82

EFFECTIVE AREA(ACRES) = 40.07 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 40.1 PEAK FLOW RATE(CFS) = 133.15

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.04

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.04 FLOW VELOCITY(FEET/SEC.) = 10.57

LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11403.00 = 1897.15 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11403.00 TO NODE 11404.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2787.96 DOWNSTREAM(FEET) = 2518.71  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1956.80 CHANNEL SLOPE = 0.1376  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.69

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.368

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	67.85	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 227.32

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.60

AVERAGE FLOW DEPTH(FEET) = 1.62 TRAVEL TIME(MIN.) = 3.08

Tc(MIN.) = 14.28

SUBAREA AREA(ACRES) = 67.85 SUBAREA RUNOFF(CFS) = 187.34

EFFECTIVE AREA(ACRES) = 107.92 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 107.9 PEAK FLOW RATE(CFS) = 297.98

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.88

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.88 FLOW VELOCITY(FEET/SEC.) = 11.52

LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11404.00 = 3853.95 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11404.00 TO NODE 11405.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2518.71 DOWNSTREAM(FEET) = 2304.57  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1944.99 CHANNEL SLOPE = 0.1101  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.38

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.963

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	80.61	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 394.73

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.56

AVERAGE FLOW DEPTH(FEET) = 2.33 TRAVEL TIME(MIN.) = 2.80

Tc(MIN.) = 17.08

SUBAREA AREA(ACRES) = 80.61 SUBAREA RUNOFF(CFS) = 193.23

EFFECTIVE AREA(ACRES) = 188.53 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 188.5 PEAK FLOW RATE(CFS) = 451.93

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.51

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.51 FLOW VELOCITY(FEET/SEC.) = 12.02

LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11405.00 = 5798.94 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11405.00 TO NODE 11406.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2304.57 DOWNSTREAM(FEET) = 1888.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3280.59 CHANNEL SLOPE = 0.1270  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.76

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.517

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	111.04	0.30	1.000	-



SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 562.86  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.50  
 AVERAGE FLOW DEPTH(FEET) = 2.71 TRAVEL TIME(MIN.) = 4.05  
 Tc(MIN.) = 21.13  
 SUBAREA AREA(ACRES) = 111.04 SUBAREA RUNOFF(CFS) = 221.58  
 EFFECTIVE AREA(ACRES) = 299.57 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 299.6 PEAK FLOW RATE(CFS) = 597.79  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.80

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.80 FLOW VELOCITY(FEET/SEC.) = 13.72  
 LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11406.00 = 9079.53 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11406.00 TO NODE 11407.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1888.00 DOWNSTREAM(FEET) = 1539.46  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2842.33 CHANNEL SLOPE = 0.1226  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.15  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.268

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	141.19	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 722.95  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.28  
 AVERAGE FLOW DEPTH(FEET) = 3.12 TRAVEL TIME(MIN.) = 3.32  
 Tc(MIN.) = 24.45  
 SUBAREA AREA(ACRES) = 141.19 SUBAREA RUNOFF(CFS) = 250.14  
 EFFECTIVE AREA(ACRES) = 440.76 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 440.8 PEAK FLOW RATE(CFS) = 780.87  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.25

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.25 FLOW VELOCITY(FEET/SEC.) = 14.59  
 LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11407.00 = 11921.86 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11407.00 TO NODE 11408.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1539.46 DOWNSTREAM(FEET) = 1268.36  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2859.01 CHANNEL SLOPE = 0.0948  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.77  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.087

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	158.63	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 908.46  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.85  
 AVERAGE FLOW DEPTH(FEET) = 3.75 TRAVEL TIME(MIN.) = 3.44  
 Tc(MIN.) = 27.89  
 SUBAREA AREA(ACRES) = 158.63 SUBAREA RUNOFF(CFS) = 255.08  
 EFFECTIVE AREA(ACRES) = 599.39 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 599.4 PEAK FLOW RATE(CFS) = 963.83  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.86

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.86 FLOW VELOCITY(FEET/SEC.) = 14.07  
 LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11408.00 = 14780.87 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11408.00 TO NODE 11409.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1268.36 DOWNSTREAM(FEET) = 1109.80  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2883.36 CHANNEL SLOPE = 0.0550  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.79  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.935

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	208.66	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1117.42  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.01  
 AVERAGE FLOW DEPTH(FEET) = 4.77 TRAVEL TIME(MIN.) = 4.00  
 Tc(MIN.) = 31.89  
 SUBAREA AREA(ACRES) = 208.66 SUBAREA RUNOFF(CFS) = 307.09  
 EFFECTIVE AREA(ACRES) = 808.05 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 808.1 PEAK FLOW RATE(CFS) = 1189.24  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.92

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 4.92 FLOW VELOCITY(FEET/SEC.) = 12.20  
LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11409.00 = 17664.23 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11409.00 TO NODE 11409.50 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1109.80 DOWNSTREAM(FEET) = 953.45  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2734.25 CHANNEL SLOPE = 0.0572  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.01  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.842

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	97.66	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1257.00  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.57  
AVERAGE FLOW DEPTH(FEET) = 5.00 TRAVEL TIME(MIN.) = 3.63  
Tc(MIN.) = 35.52

SUBAREA AREA(ACRES) = 97.66 SUBAREA RUNOFF(CFS) = 135.51  
EFFECTIVE AREA(ACRES) = 905.71 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 905.7 PEAK FLOW RATE(CFS) = 1256.73  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.00

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 5.00 FLOW VELOCITY(FEET/SEC.) = 12.57  
LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11409.50 = 20398.48 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11409.50 TO NODE 11410.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 953.45 DOWNSTREAM(FEET) = 914.20  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1100.66 CHANNEL SLOPE = 0.0357  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.80  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.798

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	130.64	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1344.78  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.75

AVERAGE FLOW DEPTH(FEET) = 5.80 TRAVEL TIME(MIN.) = 1.71  
Tc(MIN.) = 37.22  
SUBAREA AREA(ACRES) = 130.64 SUBAREA RUNOFF(CFS) = 176.09  
EFFECTIVE AREA(ACRES) = 1036.35 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1036.4 PEAK FLOW RATE(CFS) = 1396.93  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.90

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 5.90 FLOW VELOCITY(FEET/SEC.) = 10.85  
LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11410.00 = 21499.14 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11410.00 TO NODE 11411.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 914.20 DOWNSTREAM(FEET) = 740.43  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3015.96 CHANNEL SLOPE = 0.0576  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.61  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.702

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	299.66	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1585.95  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.40  
AVERAGE FLOW DEPTH(FEET) = 5.59 TRAVEL TIME(MIN.) = 3.75  
Tc(MIN.) = 40.98

SUBAREA AREA(ACRES) = 299.66 SUBAREA RUNOFF(CFS) = 378.00  
EFFECTIVE AREA(ACRES) = 1336.01 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1336.0 PEAK FLOW RATE(CFS) = 1685.27  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.76

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 5.76 FLOW VELOCITY(FEET/SEC.) = 13.61  
LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11411.00 = 24515.10 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11411.00 TO NODE 11431.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 740.43 DOWNSTREAM(FEET) = 651.70  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1605.97 CHANNEL SLOPE = 0.0553  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.89  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.652  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 70.41 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1728.10  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 13.49  
 AVERAGE FLOW DEPTH (FEET) = 5.89 TRAVEL TIME (MIN.) = 1.98  
 Tc (MIN.) = 42.96  
 SUBAREA AREA (ACRES) = 70.41 SUBAREA RUNOFF (CFS) = 85.66  
 EFFECTIVE AREA (ACRES) = 1406.42 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 1406.4 PEAK FLOW RATE (CFS) = 1711.04  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 5.86

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 5.86 FLOW VELOCITY (FEET/SEC.) = 13.46  
 LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11431.00 = 26121.07 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11411.00 TO NODE 11431.00 IS CODE = 10  
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>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<<  
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\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11023.00 TO NODE 11363.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 2 <<<<<<  
 =====

PEAK FLOWRATE TABLE FILE NAME: S10.DNA  
 MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14909.43	23.72	0.30 ( 0.30)	1.00	4362.5	11000.00
2	16530.86	35.62	0.30 ( 0.30)	1.00	7395.7	10850.00
3	16640.77	36.23	0.30 ( 0.30)	1.00	7558.4	10800.00
4	16788.13	38.21	0.30 ( 0.30)	1.00	8152.4	10900.00
5	16882.93	41.18	0.30 ( 0.30)	1.00	8950.5	10830.00
6	16882.62	41.32	0.30 ( 0.30)	1.00	8983.3	10910.00
7	16857.70	42.11	0.30 ( 0.30)	1.00	9148.8	10630.00
8	16605.70	52.74	0.30 ( 0.30)	1.00	11528.9	10600.00
9	16642.52	59.09	0.30 ( 0.30)	1.00	12978.1	10500.00
10	16666.43	63.44	0.30 ( 0.30)	1.00	13906.7	10710.00
11	16591.96	65.20	0.30 ( 0.30)	1.00	14210.9	10410.00
12	16484.75	69.43	0.30 ( 0.30)	1.00	14865.2	10700.00
13	16389.56	76.12	0.30 ( 0.30)	1.00	15831.7	10400.00
14	16270.82	77.99	0.30 ( 0.30)	1.00	16056.8	10200.00
15	15765.74	83.54	0.30 ( 0.30)	1.00	16618.4	10300.00
16	15738.68	83.76	0.30 ( 0.30)	1.00	16633.0	10320.00
17	15154.22	88.73	0.30 ( 0.30)	1.00	16839.9	10210.00
18	14089.70	113.21	0.30 ( 0.30)	1.00	17533.1	10100.00
TOTAL AREA (ACRES) =						17533.1

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11362.00 TO NODE 11363.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<<  
 =====

PEAK FLOWRATE TABLE FILE NAME: S13.DNA  
 MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6665.96	34.38	0.30 ( 0.30)	1.00	3941.4	11330.00
2	6743.83	36.83	0.30 ( 0.30)	1.00	4289.5	11350.00
3	6780.75	39.74	0.30 ( 0.30)	1.00	4661.8	11300.00
4	6796.29	41.12	0.30 ( 0.30)	1.00	4827.0	11130.00
5	6788.61	41.32	0.30 ( 0.30)	1.00	4849.2	11250.00
6	6724.92	42.02	0.30 ( 0.30)	1.00	4905.2	11220.00
7	6268.18	57.30	0.30 ( 0.30)	1.00	6025.0	11111.00
8	6225.35	58.20	0.30 ( 0.30)	1.00	6071.1	11201.00
9	6178.94	58.73	0.30 ( 0.30)	1.00	6081.5	11101.00
TOTAL AREA (ACRES) =						6081.5

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 FLOW PROCESS FROM NODE 11362.00 TO NODE 11363.00 IS CODE = 14.0  
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>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
 =====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6665.96	34.38	0.30 ( 0.30)	1.00	3941.4	11330.00
2	6743.83	36.83	0.30 ( 0.30)	1.00	4289.5	11350.00
3	6780.75	39.74	0.30 ( 0.30)	1.00	4661.8	11300.00
4	6796.29	41.12	0.30 ( 0.30)	1.00	4827.0	11130.00
5	6788.61	41.32	0.30 ( 0.30)	1.00	4849.2	11250.00
6	6724.92	42.02	0.30 ( 0.30)	1.00	4905.2	11220.00
7	6268.18	57.30	0.30 ( 0.30)	1.00	6025.0	11111.00
8	6225.35	58.20	0.30 ( 0.30)	1.00	6071.1	11201.00
9	6178.94	58.73	0.30 ( 0.30)	1.00	6081.5	11101.00
TOTAL AREA (ACRES) =						6081.5

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11023.00 TO NODE 11363.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6665.96	34.38	1.871	0.30 ( 0.30)	1.00	3941.4	11330.00
2	6743.83	36.83	1.808	0.30 ( 0.30)	1.00	4289.5	11350.00
3	6780.75	39.74	1.733	0.30 ( 0.30)	1.00	4661.8	11300.00
4	6796.29	41.12	1.698	0.30 ( 0.30)	1.00	4827.0	11130.00
5	6788.61	41.32	1.693	0.30 ( 0.30)	1.00	4849.2	11250.00
6	6724.92	42.02	1.675	0.30 ( 0.30)	1.00	4905.2	11220.00
7	6268.18	57.30	1.426	0.30 ( 0.30)	1.00	6025.0	11111.00
8	6225.35	58.20	1.420	0.30 ( 0.30)	1.00	6071.1	11201.00

9 6178.94 58.73 1.416 0.30( 0.30) 1.00 6081.5 11101.00  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11363.00 = 42748.42 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14909.43	23.72	2.323	0.30( 0.30)	1.00	4362.5	11000.00
2	16530.86	35.62	1.839	0.30( 0.30)	1.00	7395.7	10850.00
3	16640.77	36.23	1.823	0.30( 0.30)	1.00	7558.4	10800.00
4	16788.13	38.21	1.772	0.30( 0.30)	1.00	8152.4	10900.00
5	16882.93	41.18	1.696	0.30( 0.30)	1.00	8950.5	10830.00
6	16882.62	41.32	1.693	0.30( 0.30)	1.00	8983.3	10910.00
7	16857.70	42.11	1.673	0.30( 0.30)	1.00	9148.8	10630.00
8	16605.70	52.74	1.457	0.30( 0.30)	1.00	11528.9	10600.00
9	16642.52	59.09	1.414	0.30( 0.30)	1.00	12978.1	10500.00
10	16666.43	63.44	1.386	0.30( 0.30)	1.00	13906.7	10710.00
11	16591.96	65.20	1.374	0.30( 0.30)	1.00	14210.9	10410.00
12	16484.75	69.43	1.347	0.30( 0.30)	1.00	14865.2	10700.00
13	16389.56	76.12	1.303	0.30( 0.30)	1.00	15831.7	10400.00
14	16270.82	77.99	1.291	0.30( 0.30)	1.00	16056.8	10200.00
15	15765.74	83.54	1.255	0.30( 0.30)	1.00	16618.4	10300.00
16	15738.68	83.76	1.254	0.30( 0.30)	1.00	16633.0	10320.00
17	15154.22	88.73	1.221	0.30( 0.30)	1.00	16839.9	10210.00
18	14089.70	113.21	1.109	0.30( 0.30)	1.00	17533.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11363.00 = 69154.02 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20831.17	23.72	2.323	0.30( 0.30)	1.00	7081.8	11000.00
2	23028.41	34.38	1.871	0.30( 0.30)	1.00	11022.0	11330.00
3	23236.11	35.62	1.839	0.30( 0.30)	1.00	11512.7	10850.00
4	23365.67	36.23	1.823	0.30( 0.30)	1.00	11763.3	10800.00
5	23428.95	36.83	1.808	0.30( 0.30)	1.00	12026.7	11350.00
6	23549.50	38.21	1.772	0.30( 0.30)	1.00	12618.7	10900.00
7	23617.71	39.74	1.733	0.30( 0.30)	1.00	13225.2	11300.00
8	23677.43	41.12	1.698	0.30( 0.30)	1.00	13762.4	11130.00
9	23677.07	41.18	1.696	0.30( 0.30)	1.00	13783.7	10830.00
10	23671.56	41.32	1.693	0.30( 0.30)	1.00	13831.6	10910.00
11	23670.97	41.32	1.693	0.30( 0.30)	1.00	13834.3	11250.00
12	23585.39	42.02	1.675	0.30( 0.30)	1.00	14035.6	11220.00
13	23580.00	42.11	1.673	0.30( 0.30)	1.00	14060.5	10630.00
14	23010.34	52.74	1.457	0.30( 0.30)	1.00	17219.4	10600.00
15	22900.34	57.30	1.426	0.30( 0.30)	1.00	18595.6	11111.00
16	22862.70	58.20	1.420	0.30( 0.30)	1.00	18845.4	11201.00
17	22819.38	58.73	1.416	0.30( 0.30)	1.00	18977.6	11101.00
18	22808.14	59.09	1.414	0.30( 0.30)	1.00	19059.6	10500.00
19	22674.70	63.44	1.386	0.30( 0.30)	1.00	19988.2	10710.00
20	22536.93	65.20	1.374	0.30( 0.30)	1.00	20292.4	10410.00
21	22277.67	69.43	1.347	0.30( 0.30)	1.00	20946.7	10700.00
22	21942.01	76.12	1.303	0.30( 0.30)	1.00	21913.1	10400.00
23	21755.83	77.99	1.291	0.30( 0.30)	1.00	22138.3	10200.00
24	21051.15	83.54	1.255	0.30( 0.30)	1.00	22699.9	10300.00
25	21016.22	83.76	1.254	0.30( 0.30)	1.00	22714.4	10320.00
26	20252.95	88.73	1.221	0.30( 0.30)	1.00	22921.4	10210.00
27	18569.35	113.21	1.109	0.30( 0.30)	1.00	23614.5	10100.00

TOTAL AREA (ACRES) = 23614.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 23677.43 Tc(MIN.) = 41.124  
 EFFECTIVE AREA(ACRES) = 13762.35 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 23614.5  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11363.00 = 69154.02 FEET.

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FLOW PROCESS FROM NODE 11363.00 TO NODE 11431.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 678.93 DOWNSTREAM(FEET) = 651.70  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2069.94 CHANNEL SLOPE = 0.0132  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 17.70  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.644  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	165.16	0.30	0.997	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.997  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 23777.41  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.19  
 AVERAGE FLOW DEPTH(FEET) = 17.68 TRAVEL TIME(MIN.) = 2.13  
 Tc(MIN.) = 43.25  
 SUBAREA AREA(ACRES) = 165.16 SUBAREA RUNOFF(CFS) = 199.97  
 EFFECTIVE AREA(ACRES) = 13927.51 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 23779.7 PEAK FLOW RATE(CFS) = 23677.43  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 17.65  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 17.65 FLOW VELOCITY(FEET/SEC.) = 16.17  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

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FLOW PROCESS FROM NODE 11411.00 TO NODE 11431.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20831.17	25.92	2.182	0.30( 0.30)	1.00	7247.0	11000.00
2	23028.41	36.53	1.816	0.30( 0.30)	1.00	11187.2	11330.00
3	23236.11	37.76	1.784	0.30( 0.30)	1.00	11677.9	10850.00
4	23365.67	38.37	1.768	0.30( 0.30)	1.00	11928.5	10800.00
5	23428.95	38.96	1.753	0.30( 0.30)	1.00	12191.9	11350.00
6	23549.50	40.35	1.717	0.30( 0.30)	1.00	12783.9	10900.00
7	23617.71	41.87	1.679	0.30( 0.30)	1.00	13390.4	11300.00

8	23677.43	43.25	1.644	0.30 ( 0.30)	1.00	13927.5	11130.00
9	23677.07	43.31	1.643	0.30 ( 0.30)	1.00	13948.9	10830.00
10	23671.56	43.45	1.639	0.30 ( 0.30)	1.00	13996.7	10910.00
11	23670.97	43.45	1.639	0.30 ( 0.30)	1.00	13999.4	11250.00
12	23585.39	44.15	1.622	0.30 ( 0.30)	1.00	14200.8	11220.00
13	23580.00	44.24	1.620	0.30 ( 0.30)	1.00	14225.6	10630.00
14	23010.34	54.88	1.442	0.30 ( 0.30)	1.00	17384.6	10600.00
15	22900.34	59.45	1.412	0.30 ( 0.30)	1.00	18760.7	11111.00
16	22862.70	60.35	1.406	0.30 ( 0.30)	1.00	19010.6	11201.00
17	22819.38	60.88	1.402	0.30 ( 0.30)	1.00	19142.8	11101.00
18	22808.14	61.24	1.400	0.30 ( 0.30)	1.00	19224.8	10500.00
19	22674.70	65.59	1.372	0.30 ( 0.30)	1.00	20153.3	10710.00
20	22536.93	67.36	1.360	0.30 ( 0.30)	1.00	20457.5	10410.00
21	22277.67	71.59	1.333	0.30 ( 0.30)	1.00	21111.8	10700.00
22	21942.01	78.29	1.289	0.30 ( 0.30)	1.00	22078.3	10400.00
23	21755.83	80.17	1.277	0.30 ( 0.30)	1.00	22303.4	10200.00
24	21051.15	85.74	1.241	0.30 ( 0.30)	1.00	22865.0	10300.00
25	21016.22	85.96	1.239	0.30 ( 0.30)	1.00	22879.6	10320.00
26	20252.95	90.95	1.209	0.30 ( 0.30)	1.00	23086.6	10210.00
27	18569.35	115.48	1.099	0.30 ( 0.30)	1.00	23779.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1711.04	42.96	1.652	0.30 ( 0.30)	1.00	1406.4	11401.00

LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11431.00 = 26121.07 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22268.75	25.92	2.182	0.30 ( 0.30)	1.00	8095.6	11000.00
2	24659.60	36.53	1.816	0.30 ( 0.30)	1.00	12382.9	11330.00
3	24886.94	37.76	1.784	0.30 ( 0.30)	1.00	12913.9	10850.00
4	25025.46	38.37	1.768	0.30 ( 0.30)	1.00	13184.7	10800.00
5	25096.83	38.96	1.753	0.30 ( 0.30)	1.00	13467.5	11350.00
6	25234.42	40.35	1.717	0.30 ( 0.30)	1.00	14104.7	10900.00
7	25319.11	41.87	1.679	0.30 ( 0.30)	1.00	14761.2	11300.00
8	25375.76	42.96	1.652	0.30 ( 0.30)	1.00	15219.6	11401.00
9	25379.12	43.25	1.644	0.30 ( 0.30)	1.00	15333.9	11130.00
10	25376.98	43.31	1.643	0.30 ( 0.30)	1.00	15355.3	10830.00
11	25367.15	43.45	1.639	0.30 ( 0.30)	1.00	15403.2	10910.00
12	25366.29	43.45	1.639	0.30 ( 0.30)	1.00	15405.9	11250.00
13	25258.55	44.15	1.622	0.30 ( 0.30)	1.00	15607.2	11220.00
14	25250.34	44.24	1.620	0.30 ( 0.30)	1.00	15632.1	10630.00
15	24456.29	54.88	1.442	0.30 ( 0.30)	1.00	18791.0	10600.00
16	24307.54	59.45	1.412	0.30 ( 0.30)	1.00	20167.2	11111.00
17	24262.40	60.35	1.406	0.30 ( 0.30)	1.00	20417.0	11201.00
18	24214.68	60.88	1.402	0.30 ( 0.30)	1.00	20549.2	11101.00
19	24200.49	61.24	1.400	0.30 ( 0.30)	1.00	20631.2	10500.00
20	24031.24	65.59	1.372	0.30 ( 0.30)	1.00	21559.7	10710.00
21	23878.96	67.36	1.360	0.30 ( 0.30)	1.00	21863.9	10410.00
22	23584.86	71.59	1.333	0.30 ( 0.30)	1.00	22518.3	10700.00
23	23194.11	78.29	1.289	0.30 ( 0.30)	1.00	23484.7	10400.00
24	22992.45	80.17	1.277	0.30 ( 0.30)	1.00	23709.8	10200.00
25	22241.95	85.74	1.241	0.30 ( 0.30)	1.00	24271.4	10300.00
26	22205.21	85.96	1.239	0.30 ( 0.30)	1.00	24286.0	10320.00
27	21403.30	90.95	1.209	0.30 ( 0.30)	1.00	24493.0	10210.00

28	19581.02	115.48	1.099	0.30 ( 0.30)	1.00	25186.1	10100.00
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TOTAL AREA (ACRES) = 25186.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 25379.12 Tc (MIN.) = 43.254  
EFFECTIVE AREA (ACRES) = 15333.93 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 25186.1  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

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END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 25186.1 TC (MIN.) = 43.25  
EFFECTIVE AREA (ACRES) = 15333.93 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.999  
PEAK FLOW RATE (CFS) = 25379.12

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22268.75	25.92	2.182	0.30 ( 0.30)	1.00	8095.6	11000.00
2	24659.60	36.53	1.816	0.30 ( 0.30)	1.00	12382.9	11330.00
3	24886.94	37.76	1.784	0.30 ( 0.30)	1.00	12913.9	10850.00
4	25025.46	38.37	1.768	0.30 ( 0.30)	1.00	13184.7	10800.00
5	25096.83	38.96	1.753	0.30 ( 0.30)	1.00	13467.5	11350.00
6	25234.42	40.35	1.717	0.30 ( 0.30)	1.00	14104.7	10900.00
7	25319.11	41.87	1.679	0.30 ( 0.30)	1.00	14761.2	11300.00
8	25375.76	42.96	1.652	0.30 ( 0.30)	1.00	15219.6	11401.00
9	25379.12	43.25	1.644	0.30 ( 0.30)	1.00	15333.9	11130.00
10	25376.98	43.31	1.643	0.30 ( 0.30)	1.00	15355.3	10830.00
11	25367.15	43.45	1.639	0.30 ( 0.30)	1.00	15403.2	10910.00
12	25366.29	43.45	1.639	0.30 ( 0.30)	1.00	15405.9	11250.00
13	25258.55	44.15	1.622	0.30 ( 0.30)	1.00	15607.2	11220.00
14	25250.34	44.24	1.620	0.30 ( 0.30)	1.00	15632.1	10630.00
15	24456.29	54.88	1.442	0.30 ( 0.30)	1.00	18791.0	10600.00
16	24307.54	59.45	1.412	0.30 ( 0.30)	1.00	20167.2	11111.00
17	24262.40	60.35	1.406	0.30 ( 0.30)	1.00	20417.0	11201.00
18	24214.68	60.88	1.402	0.30 ( 0.30)	1.00	20549.2	11101.00
19	24200.49	61.24	1.400	0.30 ( 0.30)	1.00	20631.2	10500.00
20	24031.24	65.59	1.372	0.30 ( 0.30)	1.00	21559.7	10710.00
21	23878.96	67.36	1.360	0.30 ( 0.30)	1.00	21863.9	10410.00
22	23584.86	71.59	1.333	0.30 ( 0.30)	1.00	22518.3	10700.00
23	23194.11	78.29	1.289	0.30 ( 0.30)	1.00	23484.7	10400.00
24	22992.45	80.17	1.277	0.30 ( 0.30)	1.00	23709.8	10200.00
25	22241.95	85.74	1.241	0.30 ( 0.30)	1.00	24271.4	10300.00
26	22205.21	85.96	1.239	0.30 ( 0.30)	1.00	24286.0	10320.00
27	21403.30	90.95	1.209	0.30 ( 0.30)	1.00	24493.0	10210.00
28	19581.02	115.48	1.099	0.30 ( 0.30)	1.00	25186.1	10100.00

=====  
END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

-----  
 FILE NAME: S15.DAT  
 TIME/DATE OF STUDY: 09:58 04/01/2013  
 =====

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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
 =====

---\*TIME-OF-CONCENTRATION MODEL\*---

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
 SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
 NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.507
- 2) 10.00; 4.101
- 3) 15.00; 3.134
- 4) 20.00; 2.547
- 5) 25.00; 2.187
- 6) 30.00; 1.950
- 7) 40.00; 1.693
- 8) 50.00; 1.452
- 9) 60.00; 1.373
- 10) 90.00; 1.175
- 11) 120.00; 1.041
- 12) 180.00; 0.882
- 13) 360.00; 0.668
- 14) 1440.00; 0.297

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	HALF- CROWN TO		STREET-CROSSFALL: IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES:			MANNING FACTOR (n)
	WIDTH (FT)	CROSSFALL (FT)			WIDTH (FT)	LIP (FT)	HIKE (FT)	
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET  
 as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
 OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11500.00 TO NODE 11501.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
 =====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 352.85  
 ELEVATION DATA: UPSTREAM(FEET) = 1891.25 DOWNSTREAM(FEET) = 1665.22

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.064  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.033  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	1.58	0.30	1.000	0	8.06

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 6.73  
 TOTAL AREA(ACRES) = 1.58 PEAK FLOW RATE(CFS) = 6.73

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11501.00 TO NODE 11502.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 1665.22 DOWNSTREAM(FEET) = 1423.64  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 627.67 CHANNEL SLOPE = 0.3849  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.30  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.233  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	6.84	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.97  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.29  
 AVERAGE FLOW DEPTH(FEET) = 0.29 TRAVEL TIME(MIN.) = 1.66  
 Tc(MIN.) = 9.73  
 SUBAREA AREA(ACRES) = 6.84 SUBAREA RUNOFF(CFS) = 24.21  
 EFFECTIVE AREA(ACRES) = 8.42 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 8.4 PEAK FLOW RATE(CFS) = 29.80  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.37

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.37 FLOW VELOCITY(FEET/SEC.) = 7.48  
 LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11502.00 = 980.52 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11502.00 TO NODE 11503.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1423.64 DOWNSTREAM(FEET) = 1258.86  
CHANNEL LENGTH THRU SUBAREA(FEET) = 937.16 CHANNEL SLOPE = 0.1758  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.83

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.777

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	28.16	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 74.00

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.02

AVERAGE FLOW DEPTH(FEET) = 0.80 TRAVEL TIME(MIN.) = 1.95

Tc(MIN.) = 11.67

SUBAREA AREA(ACRES) = 28.16 SUBAREA RUNOFF(CFS) = 88.13

EFFECTIVE AREA(ACRES) = 36.58 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 36.6 PEAK FLOW RATE(CFS) = 114.48

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.03

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.03 FLOW VELOCITY(FEET/SEC.) = 9.27

LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11503.00 = 1917.68 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11503.00 TO NODE 11504.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1258.86 DOWNSTREAM(FEET) = 1009.04  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1924.29 CHANNEL SLOPE = 0.1298  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.63

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.161

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	69.67	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 204.72

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.07

AVERAGE FLOW DEPTH(FEET) = 1.55 TRAVEL TIME(MIN.) = 3.19

Tc(MIN.) = 14.86

SUBAREA AREA(ACRES) = 69.67 SUBAREA RUNOFF(CFS) = 179.40

EFFECTIVE AREA(ACRES) = 106.25 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 106.2 PEAK FLOW RATE(CFS) = 273.60

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.82

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.82 FLOW VELOCITY(FEET/SEC.) = 11.02

LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11504.00 = 3841.97 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11504.00 TO NODE 11520.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1009.04 DOWNSTREAM(FEET) = 593.37  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2817.91 CHANNEL SLOPE = 0.1475  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.04

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.703

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	65.12	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 344.15

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.32

AVERAGE FLOW DEPTH(FEET) = 2.00 TRAVEL TIME(MIN.) = 3.81

Tc(MIN.) = 18.67

SUBAREA AREA(ACRES) = 65.12 SUBAREA RUNOFF(CFS) = 140.84

EFFECTIVE AREA(ACRES) = 171.37 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 171.4 PEAK FLOW RATE(CFS) = 370.63

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.08

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.08 FLOW VELOCITY(FEET/SEC.) = 12.60

LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11520.00 = 6659.88 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11504.00 TO NODE 11520.00 IS CODE = 10

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

\*\*\*\*\*

FLOW PROCESS FROM NODE 11431.00 TO NODE 11431.00 IS CODE = 15.1

-----  
>>>>DEFINE MEMORY BANK # 2 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: S14.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap (ACRES)	Ae (ACRES)	HEADWATER NODE
1	22268.75	25.92	0.30 (0.30)	1.00	8095.6	11000.00

2	24659.60	36.53	0.30	( 0.30)	1.00	12382.9	11330.00
3	25025.46	38.37	0.30	( 0.30)	1.00	13184.7	10800.00
4	25096.83	38.96	0.30	( 0.30)	1.00	13467.5	11350.00
5	25234.42	40.35	0.30	( 0.30)	1.00	14104.7	10900.00
6	25319.11	41.87	0.30	( 0.30)	1.00	14761.2	11300.00
7	25379.12	43.25	0.30	( 0.30)	1.00	15333.9	11130.00
8	25258.55	44.15	0.30	( 0.30)	1.00	15607.2	11220.00
9	24456.29	54.88	0.30	( 0.30)	1.00	18791.0	10600.00
10	24307.54	59.45	0.30	( 0.30)	1.00	20167.2	11111.00
11	24262.40	60.35	0.30	( 0.30)	1.00	20417.0	11201.00
12	24214.68	60.88	0.30	( 0.30)	1.00	20549.2	11101.00
13	24031.24	65.59	0.30	( 0.30)	1.00	21559.7	10710.00
14	23878.96	67.36	0.30	( 0.30)	1.00	21863.9	10410.00
15	23584.86	71.59	0.30	( 0.30)	1.00	22518.3	10700.00
16	23194.11	78.29	0.30	( 0.30)	1.00	23484.7	10400.00
17	22992.45	80.17	0.30	( 0.30)	1.00	23709.8	10200.00
18	22241.95	85.74	0.30	( 0.30)	1.00	24271.4	10300.00
19	21403.30	90.95	0.30	( 0.30)	1.00	24493.0	10210.00
20	19581.02	115.48	0.30	( 0.30)	1.00	25186.1	10100.00

TOTAL AREA (ACRES) = 25186.1

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11431.00 TO NODE 11431.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22268.75	25.92	0.30 ( 0.30)	1.00	8095.6	11000.00
2	24659.60	36.53	0.30 ( 0.30)	1.00	12382.9	11330.00
3	25025.46	38.37	0.30 ( 0.30)	1.00	13184.7	10800.00
4	25096.83	38.96	0.30 ( 0.30)	1.00	13467.5	11350.00
5	25234.42	40.35	0.30 ( 0.30)	1.00	14104.7	10900.00
6	25319.11	41.87	0.30 ( 0.30)	1.00	14761.2	11300.00
7	25379.12	43.25	0.30 ( 0.30)	1.00	15333.9	11130.00
8	25258.55	44.15	0.30 ( 0.30)	1.00	15607.2	11220.00
9	24456.29	54.88	0.30 ( 0.30)	1.00	18791.0	10600.00
10	24307.54	59.45	0.30 ( 0.30)	1.00	20167.2	11111.00
11	24262.40	60.35	0.30 ( 0.30)	1.00	20417.0	11201.00
12	24214.68	60.88	0.30 ( 0.30)	1.00	20549.2	11101.00
13	24031.24	65.59	0.30 ( 0.30)	1.00	21559.7	10710.00
14	23878.96	67.36	0.30 ( 0.30)	1.00	21863.9	10410.00
15	23584.86	71.59	0.30 ( 0.30)	1.00	22518.3	10700.00
16	23194.11	78.29	0.30 ( 0.30)	1.00	23484.7	10400.00
17	22992.45	80.17	0.30 ( 0.30)	1.00	23709.8	10200.00
18	22241.95	85.74	0.30 ( 0.30)	1.00	24271.4	10300.00
19	21403.30	90.95	0.30 ( 0.30)	1.00	24493.0	10210.00
20	19581.02	115.48	0.30 ( 0.30)	1.00	25186.1	10100.00

TOTAL AREA (ACRES) = 25186.1

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11431.00 TO NODE 11520.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 651.70 DOWNSTREAM(FEET) = 593.37  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2004.08 CHANNEL SLOPE = 0.0291  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 15.20  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.578  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 54.88 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25410.69  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 22.11  
AVERAGE FLOW DEPTH(FEET) = 15.20 TRAVEL TIME(MIN.) = 1.51  
Tc(MIN.) = 44.76  
SUBAREA AREA(ACRES) = 54.88 SUBAREA RUNOFF(CFS) = 63.13  
EFFECTIVE AREA(ACRES) = 15388.81 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 25241.0 PEAK FLOW RATE(CFS) = 25379.12  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.050  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 15.19

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 15.19 FLOW VELOCITY(FEET/SEC.) = 22.12  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11520.00 = 73228.04 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11504.00 TO NODE 11520.00 IS CODE = 11  
-----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<  
=====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22268.75	27.48	2.069	0.30 ( 0.30)	1.00	8150.4	11000.00
2	24659.60	38.05	1.743	0.30 ( 0.30)	1.00	12437.8	11330.00
3	25025.46	39.89	1.696	0.30 ( 0.30)	1.00	13239.6	10800.00
4	25096.83	40.48	1.681	0.30 ( 0.30)	1.00	13522.4	11350.00
5	25234.42	41.86	1.648	0.30 ( 0.30)	1.00	14159.6	10900.00
6	25319.11	43.38	1.611	0.30 ( 0.30)	1.00	14816.1	11300.00
7	25379.12	44.76	1.578	0.30 ( 0.30)	1.00	15388.8	11130.00
8	25258.55	45.66	1.556	0.30 ( 0.30)	1.00	15662.1	11220.00
9	24456.29	56.41	1.401	0.30 ( 0.30)	1.00	18845.9	10600.00
10	24307.54	60.98	1.367	0.30 ( 0.30)	1.00	20222.0	11111.00
11	24262.40	61.88	1.361	0.30 ( 0.30)	1.00	20471.9	11201.00
12	24214.68	62.41	1.357	0.30 ( 0.30)	1.00	20604.1	11101.00
13	24031.24	67.13	1.326	0.30 ( 0.30)	1.00	21614.6	10710.00
14	23878.96	68.89	1.314	0.30 ( 0.30)	1.00	21918.8	10410.00
15	23584.86	73.13	1.286	0.30 ( 0.30)	1.00	22573.1	10700.00
16	23194.11	79.83	1.242	0.30 ( 0.30)	1.00	23539.6	10400.00
17	22992.45	81.72	1.230	0.30 ( 0.30)	1.00	23764.7	10200.00
18	22241.95	87.30	1.193	0.30 ( 0.30)	1.00	24326.3	10300.00
19	21403.30	92.53	1.164	0.30 ( 0.30)	1.00	24547.9	10210.00
20	19581.02	117.10	1.054	0.30 ( 0.30)	1.00	25241.0	10100.00



LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11520.00 = 73228.04 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	370.63	18.67	2.703	0.30( 0.30)	1.00	171.4	11500.00

LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11520.00 = 6659.88 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20916.38	18.67	2.703	0.30( 0.30)	1.00	5708.6	11500.00
2	22541.65	27.48	2.069	0.30( 0.30)	1.00	8321.8	11000.00
3	24882.20	38.05	1.743	0.30( 0.30)	1.00	12609.2	11330.00
4	25240.77	39.89	1.696	0.30( 0.30)	1.00	13411.0	10800.00
5	25309.90	40.48	1.681	0.30( 0.30)	1.00	13693.7	11350.00
6	25442.37	41.86	1.648	0.30( 0.30)	1.00	14331.0	10900.00
7	25521.39	43.38	1.611	0.30( 0.30)	1.00	14987.4	11300.00
8	25576.27	44.76	1.578	0.30( 0.30)	1.00	15560.2	11130.00
9	25452.36	45.66	1.556	0.30( 0.30)	1.00	15833.5	11220.00
10	24626.17	56.41	1.401	0.30( 0.30)	1.00	19017.2	10600.00
11	24472.05	60.98	1.367	0.30( 0.30)	1.00	20393.4	11111.00
12	24426.00	61.88	1.361	0.30( 0.30)	1.00	20643.3	11201.00
13	24377.73	62.41	1.357	0.30( 0.30)	1.00	20775.5	11101.00
14	24189.49	67.13	1.326	0.30( 0.30)	1.00	21786.0	10710.00
15	24035.41	68.89	1.314	0.30( 0.30)	1.00	22090.2	10410.00
16	23737.00	73.13	1.286	0.30( 0.30)	1.00	22744.5	10700.00
17	23339.42	79.83	1.242	0.30( 0.30)	1.00	23710.9	10400.00
18	23135.85	81.72	1.230	0.30( 0.30)	1.00	23936.1	10200.00
19	22379.66	87.30	1.193	0.30( 0.30)	1.00	24497.7	10300.00
20	21536.53	92.53	1.164	0.30( 0.30)	1.00	24719.2	10210.00
21	19697.32	117.10	1.054	0.30( 0.30)	1.00	25412.4	10100.00

TOTAL AREA (ACRES) = 25412.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 25576.27 Tc(MIN.) = 44.765  
EFFECTIVE AREA(ACRES) = 15560.18 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 25412.4  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11520.00 = 73228.04 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11520.00 TO NODE 11540.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 593.37 DOWNSTREAM(FEET) = 577.77  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1515.75 CHANNEL SLOPE = 0.0103  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.28  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.539  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	100.60	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25632.38  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.67  
AVERAGE FLOW DEPTH(FEET) = 11.27 TRAVEL TIME(MIN.) = 1.61  
Tc(MIN.) = 46.38  
SUBAREA AREA(ACRES) = 100.60 SUBAREA RUNOFF(CFS) = 112.21  
EFFECTIVE AREA(ACRES) = 15660.78 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 25513.0 PEAK FLOW RATE(CFS) = 25576.27  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.26

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 11.26 FLOW VELOCITY(FEET/SEC.) = 15.66  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11540.00 = 74743.79 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11520.00 TO NODE 11540.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 46.38  
RAINFALL INTENSITY(INCH/HR) = 1.54  
AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 15660.78  
TOTAL STREAM AREA(ACRES) = 25512.96  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 25576.27

\*\*\*\*\*

FLOW PROCESS FROM NODE 11530.00 TO NODE 11531.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 278.68  
ELEVATION DATA: UPSTREAM(FEET) = 1593.31 DOWNSTREAM(FEET) = 1523.14

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.844  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.657  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
"OPEN BRUSH"	-	1.18	0.30	1.000	0	8.84

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 4.63  
TOTAL AREA(ACRES) = 1.18 PEAK FLOW RATE(CFS) = 4.63

\*\*\*\*\*

FLOW PROCESS FROM NODE 11531.00 TO NODE 11532.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1523.14 DOWNSTREAM(FEET) = 1297.56  
CHANNEL LENGTH THRU SUBAREA(FEET) = 698.37 CHANNEL SLOPE = 0.3230  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.32

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.944

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	8.32	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.35

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.92

AVERAGE FLOW DEPTH(FEET) = 0.29 TRAVEL TIME(MIN.) = 1.97

Tc(MIN.) = 10.81

SUBAREA AREA(ACRES) = 8.32 SUBAREA RUNOFF(CFS) = 27.29

EFFECTIVE AREA(ACRES) = 9.50 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 9.5 PEAK FLOW RATE(CFS) = 31.16

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.40

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.40 FLOW VELOCITY(FEET/SEC.) = 7.22

LONGEST FLOWPATH FROM NODE 11530.00 TO NODE 11532.00 = 977.05 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11532.00 TO NODE 11533.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1297.56 DOWNSTREAM(FEET) = 1134.68  
CHANNEL LENGTH THRU SUBAREA(FEET) = 962.17 CHANNEL SLOPE = 0.1693  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.72

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.520

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.50	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 58.03

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.31

AVERAGE FLOW DEPTH(FEET) = 0.70 TRAVEL TIME(MIN.) = 2.20

Tc(MIN.) = 13.01

SUBAREA AREA(ACRES) = 18.50 SUBAREA RUNOFF(CFS) = 53.61

EFFECTIVE AREA(ACRES) = 28.00 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 28.0 PEAK FLOW RATE(CFS) = 81.14

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.85

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.85 FLOW VELOCITY(FEET/SEC.) = 8.16

LONGEST FLOWPATH FROM NODE 11530.00 TO NODE 11533.00 = 1939.22 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11533.00 TO NODE 11534.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1134.68 DOWNSTREAM(FEET) = 1002.72  
CHANNEL LENGTH THRU SUBAREA(FEET) = 956.78 CHANNEL SLOPE = 0.1379  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.61

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.222

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	98.44	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 210.83

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.37

AVERAGE FLOW DEPTH(FEET) = 1.55 TRAVEL TIME(MIN.) = 1.54

Tc(MIN.) = 14.54

SUBAREA AREA(ACRES) = 98.44 SUBAREA RUNOFF(CFS) = 258.92

EFFECTIVE AREA(ACRES) = 126.44 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 126.4 PEAK FLOW RATE(CFS) = 332.56

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.99

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.99 FLOW VELOCITY(FEET/SEC.) = 11.92

LONGEST FLOWPATH FROM NODE 11530.00 TO NODE 11534.00 = 2896.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11534.00 TO NODE 11535.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1002.72 DOWNSTREAM(FEET) = 816.20  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2160.78 CHANNEL SLOPE = 0.0863  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.85

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.812

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	134.87	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 485.32  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.26  
 AVERAGE FLOW DEPTH(FEET) = 2.77 TRAVEL TIME(MIN.) = 3.20  
 Tc(MIN.) = 17.74  
 SUBAREA AREA(ACRES) = 134.87 SUBAREA RUNOFF(CFS) = 304.95  
 EFFECTIVE AREA(ACRES) = 261.31 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 261.3 PEAK FLOW RATE(CFS) = 590.84  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.08

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.08 FLOW VELOCITY(FEET/SEC.) = 11.88  
 LONGEST FLOWPATH FROM NODE 11530.00 TO NODE 11535.00 = 5056.78 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11535.00 TO NODE 11540.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 816.20 DOWNSTREAM(FEET) = 577.77  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 3109.20 CHANNEL SLOPE = 0.0767  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.41  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.393

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 78.24 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 664.60  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.78  
 AVERAGE FLOW DEPTH(FEET) = 3.37 TRAVEL TIME(MIN.) = 4.40  
 Tc(MIN.) = 22.14

SUBAREA AREA(ACRES) = 78.24 SUBAREA RUNOFF(CFS) = 147.39  
 EFFECTIVE AREA(ACRES) = 339.55 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 339.5 PEAK FLOW RATE(CFS) = 639.65  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.31

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.31 FLOW VELOCITY(FEET/SEC.) = 11.65  
 LONGEST FLOWPATH FROM NODE 11530.00 TO NODE 11540.00 = 8165.98 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11535.00 TO NODE 11540.00 IS CODE = 1

-----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 22.14  
 RAINFALL INTENSITY(INCH/HR) = 2.39  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 339.55  
 TOTAL STREAM AREA(ACRES) = 339.55  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 639.65

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20916.38	20.38	2.519	0.30( 0.30)	1.00	5809.2	11500.00
1	22541.65	29.16	1.990	0.30( 0.30)	1.00	8422.4	11000.00
1	24882.20	39.67	1.701	0.30( 0.30)	1.00	12709.8	11330.00
1	25240.77	41.51	1.657	0.30( 0.30)	1.00	13511.6	10800.00
1	25309.90	42.10	1.642	0.30( 0.30)	1.00	13794.3	11350.00
1	25442.37	43.47	1.609	0.30( 0.30)	1.00	14431.6	10900.00
1	25521.39	45.00	1.573	0.30( 0.30)	1.00	15088.0	11300.00
1	25576.27	46.38	1.539	0.30( 0.30)	1.00	15660.8	11130.00
1	25452.36	47.28	1.518	0.30( 0.30)	1.00	15934.1	11220.00
1	24626.17	58.04	1.388	0.30( 0.30)	1.00	19117.8	10600.00
1	24472.05	62.61	1.356	0.30( 0.30)	1.00	20494.0	11111.00
1	24426.00	63.51	1.350	0.30( 0.30)	1.00	20743.9	11201.00
1	24377.73	64.05	1.346	0.30( 0.30)	1.00	20876.1	11101.00
1	24189.49	68.76	1.315	0.30( 0.30)	1.00	21886.6	10710.00
1	24035.41	70.53	1.303	0.30( 0.30)	1.00	22190.8	10410.00
1	23737.00	74.78	1.275	0.30( 0.30)	1.00	22845.1	10700.00
1	23339.42	81.49	1.231	0.30( 0.30)	1.00	23811.5	10400.00
1	23135.85	83.38	1.219	0.30( 0.30)	1.00	24036.7	10200.00
1	22379.66	88.98	1.182	0.30( 0.30)	1.00	24598.3	10300.00
1	21536.53	94.23	1.156	0.30( 0.30)	1.00	24819.8	10210.00
1	19697.32	118.84	1.046	0.30( 0.30)	1.00	25513.0	10100.00
2	639.65	22.14	2.393	0.30( 0.30)	1.00	339.5	11530.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21540.85	20.38	2.519	0.30( 0.30)	1.00	6121.9	11500.00
2	21881.35	22.14	2.393	0.30( 0.30)	1.00	6671.9	11530.00
3	23058.13	29.16	1.990	0.30( 0.30)	1.00	8762.0	11000.00
4	25310.49	39.67	1.701	0.30( 0.30)	1.00	13049.3	11330.00
5	25655.39	41.51	1.657	0.30( 0.30)	1.00	13851.1	10800.00
6	25720.18	42.10	1.642	0.30( 0.30)	1.00	14133.9	11350.00
7	25842.51	43.47	1.609	0.30( 0.30)	1.00	14771.1	10900.00
8	25910.30	45.00	1.573	0.30( 0.30)	1.00	15427.6	11300.00
9	25955.02	46.38	1.539	0.30( 0.30)	1.00	16000.3	11130.00
10	25824.47	47.28	1.518	0.30( 0.30)	1.00	16273.6	11220.00
11	24958.83	58.04	1.388	0.30( 0.30)	1.00	19457.4	10600.00
12	24794.70	62.61	1.356	0.30( 0.30)	1.00	20833.6	11111.00
13	24746.84	63.51	1.350	0.30( 0.30)	1.00	21083.4	11201.00
14	24697.49	64.05	1.346	0.30( 0.30)	1.00	21215.6	11101.00
15	24499.74	68.76	1.315	0.30( 0.30)	1.00	22226.1	10710.00

16	24342.09	70.53	1.303	0.30	( 0.30)	1.00	22530.3	10410.00
17	24035.11	74.78	1.275	0.30	( 0.30)	1.00	23184.7	10700.00
18	23624.00	81.49	1.231	0.30	( 0.30)	1.00	24151.1	10400.00
19	23416.61	83.38	1.219	0.30	( 0.30)	1.00	24376.2	10200.00
20	22649.14	88.98	1.182	0.30	( 0.30)	1.00	24937.8	10300.00
21	21798.17	94.23	1.156	0.30	( 0.30)	1.00	25159.4	10210.00
22	19925.37	118.84	1.046	0.30	( 0.30)	1.00	25852.5	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 25955.02 Tc(MIN.) = 46.38  
EFFECTIVE AREA(ACRES) = 16000.33 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 25852.5  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11540.00 = 74743.79 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11540.00 TO NODE 11541.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 577.77 DOWNSTREAM(FEET) = 556.39  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2053.36 CHANNEL SLOPE = 0.0104  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.39  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.487

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	389.46	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 26163.11

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.83

AVERAGE FLOW DEPTH(FEET) = 11.36 TRAVEL TIME(MIN.) = 2.16

Tc(MIN.) = 48.54

SUBAREA AREA(ACRES) = 389.46 SUBAREA RUNOFF(CFS) = 416.16

EFFECTIVE AREA(ACRES) = 16389.79 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 26242.0 PEAK FLOW RATE(CFS) = 25955.02

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.31

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 11.31 FLOW VELOCITY(FEET/SEC.) = 15.80

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11541.00 = 76797.15 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11541.00 TO NODE 11542.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 556.39 DOWNSTREAM(FEET) = 523.29  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3267.94 CHANNEL SLOPE = 0.0101

GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.46  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.436

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	330.30	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 26123.90

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.67

AVERAGE FLOW DEPTH(FEET) = 11.44 TRAVEL TIME(MIN.) = 3.48

Tc(MIN.) = 52.01

SUBAREA AREA(ACRES) = 330.30 SUBAREA RUNOFF(CFS) = 337.74

EFFECTIVE AREA(ACRES) = 16720.09 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 26572.3 PEAK FLOW RATE(CFS) = 25955.02

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.40

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 11.40 FLOW VELOCITY(FEET/SEC.) = 15.63

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11542.00 = 80065.09 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11542.00 TO NODE 11543.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 523.29 DOWNSTREAM(FEET) = 493.61  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2857.94 CHANNEL SLOPE = 0.0104  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.37  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.412

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	285.11	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 26097.74

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.80

AVERAGE FLOW DEPTH(FEET) = 11.36 TRAVEL TIME(MIN.) = 3.01

Tc(MIN.) = 55.03

SUBAREA AREA(ACRES) = 285.11 SUBAREA RUNOFF(CFS) = 285.43

EFFECTIVE AREA(ACRES) = 17005.20 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 26857.4 PEAK FLOW RATE(CFS) = 25955.02

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 11.32 FLOW VELOCITY(FEET/SEC.) = 15.77  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11543.00 = 82923.02 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11543.00 TO NODE 11544.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 493.61 DOWNSTREAM(FEET) = 480.21  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1963.01 CHANNEL SLOPE = 0.0068  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 12.72  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.393

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 303.63 0.30 0.987 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.987  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 26104.95  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.63  
AVERAGE FLOW DEPTH(FEET) = 12.70 TRAVEL TIME(MIN.) = 2.40  
Tc(MIN.) = 57.43  
SUBAREA AREA(ACRES) = 303.63 SUBAREA RUNOFF(CFS) = 299.85  
EFFECTIVE AREA(ACRES) = 17308.83 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 27161.0 PEAK FLOW RATE(CFS) = 25955.02  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 12.66

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 12.66 FLOW VELOCITY(FEET/SEC.) = 13.61  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11544.00 = 84886.03 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11544.00 TO NODE 11545.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 480.21 DOWNSTREAM(FEET) = 456.90  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1914.49 CHANNEL SLOPE = 0.0122  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.88  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.378

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 184.16 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 26044.38

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.70  
AVERAGE FLOW DEPTH(FEET) = 10.87 TRAVEL TIME(MIN.) = 1.91  
Tc(MIN.) = 59.34  
SUBAREA AREA(ACRES) = 184.16 SUBAREA RUNOFF(CFS) = 178.72  
EFFECTIVE AREA(ACRES) = 17492.99 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 27345.2 PEAK FLOW RATE(CFS) = 25955.02  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.85

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 10.85 FLOW VELOCITY(FEET/SEC.) = 16.69  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11545.00 = 86800.52 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11545.00 TO NODE 11726.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 456.90 DOWNSTREAM(FEET) = 436.21  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2322.79 CHANNEL SLOPE = 0.0089  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.82  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.360

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 151.95 0.30 0.844 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.844  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 26030.72  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.96  
AVERAGE FLOW DEPTH(FEET) = 11.82 TRAVEL TIME(MIN.) = 2.59  
Tc(MIN.) = 61.93  
SUBAREA AREA(ACRES) = 151.95 SUBAREA RUNOFF(CFS) = 151.41  
EFFECTIVE AREA(ACRES) = 17644.94 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 27497.1 PEAK FLOW RATE(CFS) = 25955.02  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.80

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 11.80 FLOW VELOCITY(FEET/SEC.) = 14.95  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11726.00 = 89123.31 FEET.

-----

END OF STUDY SUMMARY:  
TOTAL AREA(ACRES) = 27497.1 TC(MIN.) = 61.93  
EFFECTIVE AREA(ACRES) = 17644.94 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.997  
PEAK FLOW RATE(CFS) = 25955.02

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21540.85	36.80	1.775	0.30( 0.30)	1.00	7766.5	11500.00
2	21881.35	38.48	1.732	0.30( 0.30)	1.00	8316.5	11530.00
3	23058.13	45.25	1.566	0.30( 0.30)	1.00	10406.6	11000.00
4	25310.49	55.34	1.410	0.30( 0.30)	1.00	14693.9	11330.00
5	25655.39	57.11	1.396	0.30( 0.30)	1.00	15495.7	10800.00
6	25720.18	57.69	1.391	0.30( 0.30)	1.00	15778.5	11350.00
7	25842.51	59.04	1.381	0.30( 0.30)	1.00	16415.7	10900.00
8	25910.30	60.56	1.369	0.30( 0.30)	1.00	17072.2	11300.00
9	25955.02	61.93	1.360	0.30( 0.30)	1.00	17644.9	11130.00
10	25824.47	62.85	1.354	0.30( 0.30)	1.00	17918.2	11220.00
11	24958.83	73.77	1.282	0.30( 0.30)	1.00	21102.0	10600.00
12	24794.70	78.38	1.252	0.30( 0.30)	1.00	22478.2	11111.00
13	24746.84	79.28	1.246	0.30( 0.30)	1.00	22728.0	11201.00
14	24697.49	79.83	1.242	0.30( 0.30)	1.00	22860.2	11101.00
15	24499.74	84.59	1.211	0.30( 0.30)	1.00	23870.8	10710.00
16	24342.09	86.38	1.199	0.30( 0.30)	1.00	24174.9	10410.00
17	24035.11	90.69	1.172	0.30( 0.30)	1.00	24829.3	10700.00
18	23624.00	97.48	1.142	0.30( 0.30)	1.00	25795.7	10400.00
19	23416.61	99.42	1.133	0.30( 0.30)	1.00	26020.8	10200.00
20	22649.14	105.18	1.107	0.30( 0.30)	1.00	26582.4	10300.00
21	21798.17	110.61	1.083	0.30( 0.30)	1.00	26804.0	10210.00
22	19925.37	135.67	0.999	0.30( 0.30)	1.00	27497.1	10100.00

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

Analysis prepared by:

-----  
FILE NAME: S16.DAT  
TIME/DATE OF STUDY: 09:58 04/01/2013  
=====

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--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.507
- 2) 10.00; 4.101
- 3) 15.00; 3.134
- 4) 20.00; 2.547
- 5) 25.00; 2.187
- 6) 30.00; 1.950
- 7) 40.00; 1.693
- 8) 50.00; 1.452
- 9) 60.00; 1.373
- 10) 90.00; 1.175
- 11) 120.00; 1.041
- 12) 180.00; 0.882
- 13) 360.00; 0.668
- 14) 1440.00; 0.297

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

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FLOW PROCESS FROM NODE 11600.00 TO NODE 11601.00 IS CODE = 21  
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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 390.21  
ELEVATION DATA: UPSTREAM(FEET) = 3061.08 DOWNSTREAM(FEET) = 2962.88

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.120  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.078

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	1.79	0.30	1.000	0	10.12

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 6.09  
TOTAL AREA (ACRES) = 1.79 PEAK FLOW RATE (CFS) = 6.09

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FLOW PROCESS FROM NODE 11601.00 TO NODE 11602.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2962.88 DOWNSTREAM(FEET) = 2839.39  
CHANNEL LENGTH THRU SUBAREA(FEET) = 548.33 CHANNEL SLOPE = 0.2252  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.28  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.705

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	4.88	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 13.59  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.74  
AVERAGE FLOW DEPTH(FEET) = 0.27 TRAVEL TIME(MIN.) = 1.93  
Tc(MIN.) = 12.05  
SUBAREA AREA(ACRES) = 4.88 SUBAREA RUNOFF(CFS) = 14.96  
EFFECTIVE AREA(ACRES) = 6.67 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 6.7 PEAK FLOW RATE(CFS) = 20.44  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.35

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.35 FLOW VELOCITY(FEET/SEC.) = 5.52  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11602.00 = 938.54 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11602.00 TO NODE 11603.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2839.39 DOWNSTREAM(FEET) = 2697.55  
CHANNEL LENGTH THRU SUBAREA(FEET) = 976.87 CHANNEL SLOPE = 0.1452  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.80

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.264

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	31.42	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 62.53

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.14

AVERAGE FLOW DEPTH(FEET) = 0.76 TRAVEL TIME(MIN.) = 2.28

Tc(MIN.) = 14.33

SUBAREA AREA(ACRES) = 31.42 SUBAREA RUNOFF(CFS) = 83.82

EFFECTIVE AREA(ACRES) = 38.09 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 38.1 PEAK FLOW RATE(CFS) = 101.62

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.01

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.01 FLOW VELOCITY(FEET/SEC.) = 8.37

LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11603.00 = 1915.41 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11603.00 TO NODE 11604.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2697.55 DOWNSTREAM(FEET) = 2598.90  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1887.15 CHANNEL SLOPE = 0.0523  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.96

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.689

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	72.03	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 179.56

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.05

AVERAGE FLOW DEPTH(FEET) = 1.86 TRAVEL TIME(MIN.) = 4.46

Tc(MIN.) = 18.79

SUBAREA AREA(ACRES) = 72.03 SUBAREA RUNOFF(CFS) = 154.90

EFFECTIVE AREA(ACRES) = 110.12 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 110.1 PEAK FLOW RATE(CFS) = 236.81

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.16

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.16 FLOW VELOCITY(FEET/SEC.) = 7.65

LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11604.00 = 3802.56 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11604.00 TO NODE 11605.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2598.90 DOWNSTREAM(FEET) = 2464.25  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2488.89 CHANNEL SLOPE = 0.0541  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.60

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.282

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	96.28	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 322.94

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.48

AVERAGE FLOW DEPTH(FEET) = 2.53 TRAVEL TIME(MIN.) = 4.89

Tc(MIN.) = 23.68

SUBAREA AREA(ACRES) = 96.28 SUBAREA RUNOFF(CFS) = 171.77

EFFECTIVE AREA(ACRES) = 206.40 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 206.4 PEAK FLOW RATE(CFS) = 368.24

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.71

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.71 FLOW VELOCITY(FEET/SEC.) = 8.81

LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11605.00 = 6291.45 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11605.00 TO NODE 11606.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2464.25 DOWNSTREAM(FEET) = 2359.99  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1936.71 CHANNEL SLOPE = 0.0538  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.52

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.097

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	266.26	0.30	1.000	-



SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 583.70  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.00  
AVERAGE FLOW DEPTH(FEET) = 3.45 TRAVEL TIME(MIN.) = 3.23  
Tc(MIN.) = 26.91  
SUBAREA AREA(ACRES) = 266.26 SUBAREA RUNOFF(CFS) = 430.56  
EFFECTIVE AREA(ACRES) = 472.66 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 472.7 PEAK FLOW RATE(CFS) = 764.33  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.96

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.96 FLOW VELOCITY(FEET/SEC.) = 10.76  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11606.00 = 8228.16 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11606.00 TO NODE 11607.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2359.99 DOWNSTREAM(FEET) = 1905.15  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3829.49 CHANNEL SLOPE = 0.1188  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.46  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.919

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 132.44 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 860.84  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.84  
AVERAGE FLOW DEPTH(FEET) = 3.44 TRAVEL TIME(MIN.) = 4.30  
Tc(MIN.) = 31.21  
SUBAREA AREA(ACRES) = 132.44 SUBAREA RUNOFF(CFS) = 192.98  
EFFECTIVE AREA(ACRES) = 605.10 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 605.1 PEAK FLOW RATE(CFS) = 881.72  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.48

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.48 FLOW VELOCITY(FEET/SEC.) = 14.92  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11607.00 = 12057.65 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11607.00 TO NODE 11608.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1905.15 DOWNSTREAM(FEET) = 1717.92  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1095.02 CHANNEL SLOPE = 0.1710  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.28  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.892

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 76.91 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 936.81  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 17.32  
AVERAGE FLOW DEPTH(FEET) = 3.27 TRAVEL TIME(MIN.) = 1.05  
Tc(MIN.) = 32.26  
SUBAREA AREA(ACRES) = 76.91 SUBAREA RUNOFF(CFS) = 110.19  
EFFECTIVE AREA(ACRES) = 682.01 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 682.0 PEAK FLOW RATE(CFS) = 977.16  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.34

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.34 FLOW VELOCITY(FEET/SEC.) = 17.51  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11608.00 = 13152.67 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11608.00 TO NODE 11609.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1717.92 DOWNSTREAM(FEET) = 1516.24  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1480.24 CHANNEL SLOPE = 0.1362  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.96  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.855

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 328.91 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1207.31  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 17.08  
AVERAGE FLOW DEPTH(FEET) = 3.95 TRAVEL TIME(MIN.) = 1.44  
Tc(MIN.) = 33.71  
SUBAREA AREA(ACRES) = 328.91 SUBAREA RUNOFF(CFS) = 460.26  
EFFECTIVE AREA(ACRES) = 1010.92 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1010.9 PEAK FLOW RATE(CFS) = 1414.64  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.28

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 4.28 FLOW VELOCITY(FEET/SEC.) = 17.84  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11609.00 = 14632.91 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11609.00 TO NODE 11610.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1516.24 DOWNSTREAM(FEET) = 1332.01  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1925.38 CHANNEL SLOPE = 0.0957  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.06  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.804

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	355.16	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1655.08  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.33  
AVERAGE FLOW DEPTH(FEET) = 5.05 TRAVEL TIME(MIN.) = 1.97  
Tc(MIN.) = 35.67

SUBAREA AREA(ACRES) = 355.16 SUBAREA RUNOFF(CFS) = 480.85  
EFFECTIVE AREA(ACRES) = 1366.08 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1366.1 PEAK FLOW RATE(CFS) = 1849.53  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.33

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 5.33 FLOW VELOCITY(FEET/SEC.) = 16.80  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11610.00 = 16558.29 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11610.00 TO NODE 11611.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1332.01 DOWNSTREAM(FEET) = 1105.34  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2901.03 CHANNEL SLOPE = 0.0781  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.82  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.726

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	234.59	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2000.11  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.93

AVERAGE FLOW DEPTH(FEET) = 5.81 TRAVEL TIME(MIN.) = 3.04  
Tc(MIN.) = 38.71  
SUBAREA AREA(ACRES) = 234.59 SUBAREA RUNOFF(CFS) = 301.14  
EFFECTIVE AREA(ACRES) = 1600.67 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1600.7 PEAK FLOW RATE(CFS) = 2054.75  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.89

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 5.89 FLOW VELOCITY(FEET/SEC.) = 16.04  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11611.00 = 19459.32 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11611.00 TO NODE 11612.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1105.34 DOWNSTREAM(FEET) = 1030.47  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1982.46 CHANNEL SLOPE = 0.0378  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.21  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.660

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	212.67	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2184.94  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.44  
AVERAGE FLOW DEPTH(FEET) = 7.20 TRAVEL TIME(MIN.) = 2.66  
Tc(MIN.) = 41.36

SUBAREA AREA(ACRES) = 212.67 SUBAREA RUNOFF(CFS) = 260.36  
EFFECTIVE AREA(ACRES) = 1813.34 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1813.3 PEAK FLOW RATE(CFS) = 2219.95  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.25

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 7.25 FLOW VELOCITY(FEET/SEC.) = 12.50  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11612.00 = 21441.78 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11612.00 TO NODE 11630.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1030.47 DOWNSTREAM(FEET) = 870.22  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3051.86 CHANNEL SLOPE = 0.0525  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 7.10  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.576  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 465.36 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2487.19  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 14.55  
 AVERAGE FLOW DEPTH (FEET) = 7.08 TRAVEL TIME (MIN.) = 3.50  
 Tc (MIN.) = 44.86  
 SUBAREA AREA (ACRES) = 465.36 SUBAREA RUNOFF (CFS) = 534.42  
 EFFECTIVE AREA (ACRES) = 2278.70 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 2278.7 PEAK FLOW RATE (CFS) = 2616.87  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 7.25

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 7.25 FLOW VELOCITY (FEET/SEC.) = 14.75  
 LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11630.00 = 24493.64 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11612.00 TO NODE 11630.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<  
 -----  
 TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION (MIN.) = 44.86  
 RAINFALL INTENSITY (INCH/HR) = 1.58  
 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA (ACRES) = 2278.70  
 TOTAL STREAM AREA (ACRES) = 2278.70  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 2616.87

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11620.00 TO NODE 11621.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
 -----

INITIAL SUBAREA FLOW-LENGTH (FEET) = 266.64  
 ELEVATION DATA: UPSTREAM (FEET) = 2567.03 DOWNSTREAM (FEET) = 2486.90  
 Tc = K \* [(LENGTH \*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 8.387  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 4.877  
 SUBAREA Tc AND LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
 NATURAL FAIR COVER  
 "CHAPARRAL, BROADLEAF" - 0.69 0.30 1.000 0 8.39  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF (CFS) = 2.84  
 TOTAL AREA (ACRES) = 0.69 PEAK FLOW RATE (CFS) = 2.84

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11621.00 TO NODE 11622.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<  
 -----

ELEVATION DATA: UPSTREAM (FEET) = 2486.90 DOWNSTREAM (FEET) = 2424.91  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 712.48 CHANNEL SLOPE = 0.0870  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.31  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.633  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 3.63 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 8.37  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 2.94  
 AVERAGE FLOW DEPTH (FEET) = 0.27 TRAVEL TIME (MIN.) = 4.03  
 Tc (MIN.) = 12.42  
 SUBAREA AREA (ACRES) = 3.63 SUBAREA RUNOFF (CFS) = 10.89  
 EFFECTIVE AREA (ACRES) = 4.32 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 4.3 PEAK FLOW RATE (CFS) = 12.96  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.35

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.35 FLOW VELOCITY (FEET/SEC.) = 3.48  
 LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11622.00 = 979.12 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11622.00 TO NODE 11623.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<  
 -----

ELEVATION DATA: UPSTREAM (FEET) = 2424.91 DOWNSTREAM (FEET) = 2351.48  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 977.46 CHANNEL SLOPE = 0.0751  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.64  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.006  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 13.42 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 29.39  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.44

AVERAGE FLOW DEPTH(FEET) = 0.59 TRAVEL TIME(MIN.) = 3.67  
Tc(MIN.) = 16.09  
SUBAREA AREA(ACRES) = 13.42 SUBAREA RUNOFF(CFS) = 32.68  
EFFECTIVE AREA(ACRES) = 17.74 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 17.7 PEAK FLOW RATE(CFS) = 43.20  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.74

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.74 FLOW VELOCITY(FEET/SEC.) = 5.05  
LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11623.00 = 1956.58 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11623.00 TO NODE 11624.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2351.48 DOWNSTREAM(FEET) = 2317.87  
CHANNEL LENGTH THRU SUBAREA(FEET) = 947.96 CHANNEL SLOPE = 0.0355  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.15  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.581  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	16.02	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 59.70  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.37  
AVERAGE FLOW DEPTH(FEET) = 1.12 TRAVEL TIME(MIN.) = 3.62  
Tc(MIN.) = 19.71

SUBAREA AREA(ACRES) = 16.02 SUBAREA RUNOFF(CFS) = 32.89  
EFFECTIVE AREA(ACRES) = 33.76 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 33.8 PEAK FLOW RATE(CFS) = 69.31  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.22 FLOW VELOCITY(FEET/SEC.) = 4.59  
LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11624.00 = 2904.54 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11624.00 TO NODE 11624.50 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2317.87 DOWNSTREAM(FEET) = 2292.33  
CHANNEL LENGTH THRU SUBAREA(FEET) = 758.23 CHANNEL SLOPE = 0.0337  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.54  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.389  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	32.93	0.30	0.984	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.984  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 100.35  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.08  
AVERAGE FLOW DEPTH(FEET) = 1.52 TRAVEL TIME(MIN.) = 2.49  
Tc(MIN.) = 22.20

SUBAREA AREA(ACRES) = 32.93 SUBAREA RUNOFF(CFS) = 62.05  
EFFECTIVE AREA(ACRES) = 66.69 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 66.7 PEAK FLOW RATE(CFS) = 125.53  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.72

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.72 FLOW VELOCITY(FEET/SEC.) = 5.43  
LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11624.50 = 3662.77 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11624.50 TO NODE 11625.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2292.33 DOWNSTREAM(FEET) = 2256.59  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1098.98 CHANNEL SLOPE = 0.0325  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.06  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.171  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	48.16	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 166.11  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.83  
AVERAGE FLOW DEPTH(FEET) = 2.03 TRAVEL TIME(MIN.) = 3.14  
Tc(MIN.) = 25.34

SUBAREA AREA(ACRES) = 48.16 SUBAREA RUNOFF(CFS) = 81.10  
EFFECTIVE AREA(ACRES) = 114.85 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 114.9 PEAK FLOW RATE(CFS) = 193.55  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.20

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.20 FLOW VELOCITY(FEET/SEC.) = 6.10  
LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11625.00 = 4761.75 FEET.

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*****
FLOW PROCESS FROM NODE 11625.00 TO NODE 11626.00 IS CODE = 56
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 2256.59 DOWNSTREAM(FEET) = 2104.66
CHANNEL LENGTH THRU SUBAREA(FEET) = 2056.93 CHANNEL SLOPE = 0.0739
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.51
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.004
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
LAND USE            GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -       212.15   0.30   0.950   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.950
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 357.89
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.75
AVERAGE FLOW DEPTH(FEET) = 2.46 TRAVEL TIME(MIN.) = 3.51
Tc(MIN.) = 28.85
SUBAREA AREA(ACRES) = 212.15 SUBAREA RUNOFF(CFS) = 328.32
EFFECTIVE AREA(ACRES) = 327.00 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 327.0 PEAK FLOW RATE(CFS) = 504.65
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.95

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.95 FLOW VELOCITY(FEET/SEC.) = 10.76
LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11626.00 = 6818.68 FEET.

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FLOW PROCESS FROM NODE 11626.00 TO NODE 11627.00 IS CODE = 56
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 2104.66 DOWNSTREAM(FEET) = 1837.03
CHANNEL LENGTH THRU SUBAREA(FEET) = 2716.08 CHANNEL SLOPE = 0.0985
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.04
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.887
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
LAND USE            GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -       147.74   0.30   1.000   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 610.20
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.61
AVERAGE FLOW DEPTH(FEET) = 3.02 TRAVEL TIME(MIN.) = 3.59
Tc(MIN.) = 32.44
SUBAREA AREA(ACRES) = 147.74 SUBAREA RUNOFF(CFS) = 211.06
EFFECTIVE AREA(ACRES) = 474.74 AREA-AVERAGED Fm(INCH/HR) = 0.29

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AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 474.7 PEAK FLOW RATE(CFS) = 681.21
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.20

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.20 FLOW VELOCITY(FEET/SEC.) = 12.98
LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11627.00 = 9534.76 FEET.

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FLOW PROCESS FROM NODE 11627.00 TO NODE 11628.00 IS CODE = 56
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1837.03 DOWNSTREAM(FEET) = 1393.93
CHANNEL LENGTH THRU SUBAREA(FEET) = 2077.86 CHANNEL SLOPE = 0.2132
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.89
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.838
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
LAND USE            GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -       202.44   0.30   1.000   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 821.33
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 18.09
AVERAGE FLOW DEPTH(FEET) = 2.88 TRAVEL TIME(MIN.) = 1.91
Tc(MIN.) = 34.36
SUBAREA AREA(ACRES) = 202.44 SUBAREA RUNOFF(CFS) = 280.24
EFFECTIVE AREA(ACRES) = 677.18 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 677.2 PEAK FLOW RATE(CFS) = 940.42
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.09

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.09 FLOW VELOCITY(FEET/SEC.) = 18.77
LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11628.00 = 11612.62 FEET.

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FLOW PROCESS FROM NODE 11628.00 TO NODE 11629.00 IS CODE = 56
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1393.93 DOWNSTREAM(FEET) = 1201.61
CHANNEL LENGTH THRU SUBAREA(FEET) = 2844.34 CHANNEL SLOPE = 0.0676
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 4.37
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.742
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS

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LAND USE            GROUP    (ACRES)    (INCH/HR)    (DECIMAL)    CN  
 USER-DEFINED       -        141.55      0.30        1.000       -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1032.29  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.68  
 AVERAGE FLOW DEPTH(FEET) = 4.35    TRAVEL TIME(MIN.) = 3.74  
 Tc(MIN.) = 38.09  
 SUBAREA AREA(ACRES) = 141.55        SUBAREA RUNOFF(CFS) = 183.71  
 EFFECTIVE AREA(ACRES) = 818.73      AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30    AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 818.7            PEAK FLOW RATE(CFS) = 1065.59  
 GIVEN CHANNEL BASE(FEET) = 10.00    CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000    MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.42

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.42    FLOW VELOCITY(FEET/SEC.) = 12.79  
 LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11629.00 = 14456.96 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11629.00 TO NODE 11630.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1201.61    DOWNSTREAM(FEET) = 870.22  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 3807.89    CHANNEL SLOPE = 0.0870  
 GIVEN CHANNEL BASE(FEET) = 10.00    CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000    MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.28  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.632

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/    SCS SOIL    AREA    Fp    Ap    SCS  
 LAND USE            GROUP    (ACRES)    (INCH/HR)    (DECIMAL)    CN  
 USER-DEFINED       -        106.41      0.30        1.000       -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1129.36  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.24  
 AVERAGE FLOW DEPTH(FEET) = 4.28    TRAVEL TIME(MIN.) = 4.46  
 Tc(MIN.) = 42.55  
 SUBAREA AREA(ACRES) = 106.41        SUBAREA RUNOFF(CFS) = 127.53  
 EFFECTIVE AREA(ACRES) = 925.14      AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30    AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 925.1            PEAK FLOW RATE(CFS) = 1111.72  
 GIVEN CHANNEL BASE(FEET) = 10.00    CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000    MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.24

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.24    FLOW VELOCITY(FEET/SEC.) = 14.19  
 LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11630.00 = 18264.85 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11629.00 TO NODE 11630.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 42.55  
 RAINFALL INTENSITY(INCH/HR) = 1.63  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.99  
 EFFECTIVE STREAM AREA(ACRES) = 925.14  
 TOTAL STREAM AREA(ACRES) = 925.14  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 1111.72

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2616.87	44.86	1.576	0.30( 0.30)	1.00	2278.7	11600.00
2	1111.72	42.55	1.632	0.30( 0.30)	0.99	925.1	11620.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3702.17	42.55	1.632	0.30( 0.30)	1.00	3086.7	11620.00
2	3682.31	44.86	1.576	0.30( 0.30)	1.00	3203.8	11600.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 3702.17    Tc(MIN.) = 42.55  
 EFFECTIVE AREA(ACRES) = 3086.67    AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30    AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 3203.8  
 LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11630.00 = 24493.64 FEET.

END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 3203.8    TC(MIN.) = 42.55  
 EFFECTIVE AREA(ACRES) = 3086.67    AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30    AREA-AVERAGED Ap = 0.996  
 PEAK FLOW RATE(CFS) = 3702.17

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3702.17	42.55	1.632	0.30( 0.30)	1.00	3086.7	11620.00
2	3682.31	44.86	1.576	0.30( 0.30)	1.00	3203.8	11600.00

END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

-----  
FILE NAME: S17.DAT  
TIME/DATE OF STUDY: 09:58 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.507
- 2) 10.00; 4.101
- 3) 15.00; 3.134
- 4) 20.00; 2.547
- 5) 25.00; 2.187
- 6) 30.00; 1.950
- 7) 40.00; 1.693
- 8) 50.00; 1.452
- 9) 60.00; 1.373
- 10) 90.00; 1.175
- 11) 120.00; 1.041
- 12) 180.00; 0.882
- 13) 360.00; 0.668
- 14) 1440.00; 0.297

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11701.00 TO NODE 11702.00 IS CODE = 21  
-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 291.79  
ELEVATION DATA: UPSTREAM(FEET) = 1581.05 DOWNSTREAM(FEET) = 1496.25

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.753  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.701  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 2.72 0.30 1.000 0 8.75  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 10.77  
TOTAL AREA (ACRES) = 2.72 PEAK FLOW RATE (CFS) = 10.77

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11702.00 TO NODE 11703.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1496.25 DOWNSTREAM(FEET) = 1254.33  
CHANNEL LENGTH THRU SUBAREA(FEET) = 563.54 CHANNEL SLOPE = 0.4293  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.36  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.108  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN  
USER-DEFINED - 10.12 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 28.21  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.62  
AVERAGE FLOW DEPTH(FEET) = 0.35 TRAVEL TIME(MIN.) = 1.23  
Tc(MIN.) = 9.99  
SUBAREA AREA(ACRES) = 10.12 SUBAREA RUNOFF(CFS) = 34.68  
EFFECTIVE AREA(ACRES) = 12.84 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 12.8 PEAK FLOW RATE(CFS) = 44.01  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.45

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.45 FLOW VELOCITY(FEET/SEC.) = 8.91  
LONGEST FLOWPATH FROM NODE 11701.00 TO NODE 11703.00 = 855.33 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11703.00 TO NODE 11704.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1254.33 DOWNSTREAM(FEET) = 1143.91  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1025.91 CHANNEL SLOPE = 0.1076  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.96

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.624

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	21.52	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 76.29

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.89

AVERAGE FLOW DEPTH(FEET) = 0.93 TRAVEL TIME(MIN.) = 2.48

Tc(MIN.) = 12.47

SUBAREA AREA(ACRES) = 21.52 SUBAREA RUNOFF(CFS) = 64.37

EFFECTIVE AREA(ACRES) = 34.36 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 34.4 PEAK FLOW RATE(CFS) = 102.78

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.11

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.11 FLOW VELOCITY(FEET/SEC.) = 7.58

LONGEST FLOWPATH FROM NODE 11701.00 TO NODE 11704.00 = 1881.24 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11704.00 TO NODE 11705.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1143.91 DOWNSTREAM(FEET) = 804.90  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1952.20 CHANNEL SLOPE = 0.1737  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.32

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.064

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	50.19	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 165.39

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.39

AVERAGE FLOW DEPTH(FEET) = 1.27 TRAVEL TIME(MIN.) = 3.13

Tc(MIN.) = 15.60

SUBAREA AREA(ACRES) = 50.19 SUBAREA RUNOFF(CFS) = 124.84

EFFECTIVE AREA(ACRES) = 84.55 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 84.6 PEAK FLOW RATE(CFS) = 210.30

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.45

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.45 FLOW VELOCITY(FEET/SEC.) = 11.22

LONGEST FLOWPATH FROM NODE 11701.00 TO NODE 11705.00 = 3833.44 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11705.00 TO NODE 11721.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 804.90 DOWNSTREAM(FEET) = 725.34  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1056.71 CHANNEL SLOPE = 0.0753  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.93

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.823

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	15.89	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 228.35

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.61

AVERAGE FLOW DEPTH(FEET) = 1.92 TRAVEL TIME(MIN.) = 2.05

Tc(MIN.) = 17.65

SUBAREA AREA(ACRES) = 15.89 SUBAREA RUNOFF(CFS) = 36.09

EFFECTIVE AREA(ACRES) = 100.44 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 100.4 PEAK FLOW RATE(CFS) = 228.10

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.92

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.92 FLOW VELOCITY(FEET/SEC.) = 8.60

LONGEST FLOWPATH FROM NODE 11701.00 TO NODE 11721.00 = 4890.15 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11705.00 TO NODE 11721.00 IS CODE = 10

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

\*\*\*\*\*

FLOW PROCESS FROM NODE 11630.00 TO NODE 11630.00 IS CODE = 15.1

-----  
>>>>DEFINE MEMORY BANK # 2 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: S16.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap (ACRES)	Ae (ACRES)	HEADWATER NODE
1	3702.17	42.55	0.30 (0.30)	1.00	3086.7	11620.00



```

2      3682.31  44.86  0.30( 0.30) 1.00   3203.8  11600.00
TOTAL AREA (ACRES) =      3203.8

*****
FLOW PROCESS FROM NODE 11630.00 TO NODE 11630.00 IS CODE = 14.0
-----
>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<
=====
MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
STREAM      Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS)   (MIN.) (INCH/HR)   (ACRES)  NODE
1      3702.17  42.55  0.30( 0.30) 1.00   3086.7  11620.00
2      3682.31  44.86  0.30( 0.30) 1.00   3203.8  11600.00
TOTAL AREA (ACRES) =      3203.8

*****
FLOW PROCESS FROM NODE 11630.00 TO NODE 11721.00 IS CODE = 56
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 870.22 DOWNSTREAM(FEET) = 725.34
CHANNEL LENGTH THRU SUBAREA(FEET) = 3507.54 CHANNEL SLOPE = 0.0413
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.12
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.537
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/  SCS SOIL  AREA  Fp  Ap  SCS
LAND USE  GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED  -  213.50  0.30  1.000  -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3821.00
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.85
AVERAGE FLOW DEPTH(FEET) = 9.11 TRAVEL TIME(MIN.) = 3.94
Tc(MIN.) = 46.49
SUBAREA AREA(ACRES) = 213.50 SUBAREA RUNOFF(CFS) = 237.64
EFFECTIVE AREA(ACRES) = 3300.17 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 3417.3 PEAK FLOW RATE(CFS) = 3702.17
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 8.98

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 8.98 FLOW VELOCITY(FEET/SEC.) = 14.73
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11721.00 = 28001.18 FEET.

*****
FLOW PROCESS FROM NODE 11705.00 TO NODE 11721.00 IS CODE = 11
-----
>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<
=====
** MAIN STREAM CONFLUENCE DATA **

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STREAM      Q      Tc      Intensity  Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)   (ACRES)  NODE
1      3702.17  46.49  1.537  0.30( 0.30) 1.00   3300.2  11620.00
2      3682.31  48.80  1.481  0.30( 0.30) 1.00   3417.3  11600.00
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11721.00 = 28001.18 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **
STREAM      Q      Tc      Intensity  Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)   (ACRES)  NODE
1      228.10  17.65  2.823  0.30( 0.30) 1.00   100.4  11701.00
LONGEST FLOWPATH FROM NODE 11701.00 TO NODE 11721.00 = 4890.15 FEET.

** PEAK FLOW RATE TABLE **
STREAM      Q      Tc      Intensity  Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)   (ACRES)  NODE
1      3094.31  17.65  2.823  0.30( 0.30) 1.00   1353.2  11701.00
2      3813.97  46.49  1.537  0.30( 0.30) 1.00   3400.6  11620.00
3      3789.07  48.80  1.481  0.30( 0.30) 1.00   3517.8  11600.00
TOTAL AREA(ACRES) =      3517.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 3813.97 Tc(MIN.) = 46.487
EFFECTIVE AREA(ACRES) = 3400.61 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 3517.8
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11721.00 = 28001.18 FEET.

*****
FLOW PROCESS FROM NODE 11721.00 TO NODE 11722.00 IS CODE = 56
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 725.34 DOWNSTREAM(FEET) = 657.70
CHANNEL LENGTH THRU SUBAREA(FEET) = 1845.27 CHANNEL SLOPE = 0.0367
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.45
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.462
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/  SCS SOIL  AREA  Fp  Ap  SCS
LAND USE  GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED  -  185.10  0.30  1.000  -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3910.80
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.98
AVERAGE FLOW DEPTH(FEET) = 3.45 TRAVEL TIME(MIN.) = 3.08
Tc(MIN.) = 49.57
SUBAREA AREA(ACRES) = 185.10 SUBAREA RUNOFF(CFS) = 193.65
EFFECTIVE AREA(ACRES) = 3585.71 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 3702.9 PEAK FLOW RATE(CFS) = 3813.97
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.39

```

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.39 FLOW VELOCITY(FEET/SEC.) = 9.90  
 LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11722.00 = 29846.45 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11722.00 TO NODE 11723.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 657.70 DOWNSTREAM(FEET) = 609.57  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1967.44 CHANNEL SLOPE = 0.0245  
 GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.90  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.426

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	273.16	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3952.37  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.78  
 AVERAGE FLOW DEPTH(FEET) = 3.90 TRAVEL TIME(MIN.) = 3.74  
 Tc(MIN.) = 53.31

SUBAREA AREA(ACRES) = 273.16 SUBAREA RUNOFF(CFS) = 276.81  
 EFFECTIVE AREA(ACRES) = 3858.87 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 3976.0 PEAK FLOW RATE(CFS) = 3913.42  
 GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.87

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.87 FLOW VELOCITY(FEET/SEC.) = 8.75  
 LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11723.00 = 31813.89 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3094.31	24.89	2.195	0.30( 0.30)	1.00	1811.4	11701.00
2	3913.42	53.31	1.426	0.30( 0.30)	1.00	3858.9	11620.00
3	3966.31	55.63	1.407	0.30( 0.30)	1.00	3976.0	11600.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 3966.31 Tc(MIN.) = 55.63  
 AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 3976.04

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11723.00 TO NODE 11724.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 609.57 DOWNSTREAM(FEET) = 546.77  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2808.53 CHANNEL SLOPE = 0.0224  
 GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.05  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.366

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	159.72	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4042.92  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.58  
 AVERAGE FLOW DEPTH(FEET) = 4.05 TRAVEL TIME(MIN.) = 5.45  
 Tc(MIN.) = 61.09

SUBAREA AREA(ACRES) = 159.72 SUBAREA RUNOFF(CFS) = 153.22  
 EFFECTIVE AREA(ACRES) = 4135.76 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 4135.8 PEAK FLOW RATE(CFS) = 3970.39  
 GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.01

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.01 FLOW VELOCITY(FEET/SEC.) = 8.53  
 LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11724.00 = 34622.42 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3094.31	30.79	1.930	0.30( 0.30)	1.00	1971.2	11701.00
2	3918.74	58.78	1.383	0.30( 0.30)	1.00	4018.6	11620.00
3	3970.39	61.09	1.366	0.30( 0.30)	1.00	4135.8	11600.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 3970.39 Tc(MIN.) = 61.09  
 AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 4135.76

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11724.00 TO NODE 11725.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 546.77 DOWNSTREAM(FEET) = 483.75  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2921.33 CHANNEL SLOPE = 0.0216  
 GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.09  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.328

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	134.67	0.30	0.917	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.917  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4034.20  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.49  
 AVERAGE FLOW DEPTH(FEET) = 4.09 TRAVEL TIME(MIN.) = 5.74  
 Tc(MIN.) = 66.83

SUBAREA AREA (ACRES) = 134.67 SUBAREA RUNOFF (CFS) = 127.61  
 EFFECTIVE AREA (ACRES) = 4270.43 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 4270.4 PEAK FLOW RATE (CFS) = 3970.39  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 100.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 4.05

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 4.05 FLOW VELOCITY (FEET/SEC.) = 8.43  
 LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11725.00 = 37543.75 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3094.31	37.02	1.770	0.30 ( 0.30)	0.99	2105.8	11701.00
2	3918.74	64.56	1.343	0.30 ( 0.30)	0.99	4153.3	11620.00
3	3970.39	66.83	1.328	0.30 ( 0.30)	0.99	4270.4	11600.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 3970.39 Tc (MIN.) = 66.83  
 AREA-AVERAGED Fm (INCH/HR) = 0.30 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA (ACRES) = 4270.43

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11725.00 TO NODE 11726.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 483.75 DOWNSTREAM (FEET) = 436.21  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2685.66 CHANNEL SLOPE = 0.0177  
 GIVEN CHANNEL BASE (FEET) = 100.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 4.32  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.291  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	121.44	0.30	0.986	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.986  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 4024.77  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.94  
 AVERAGE FLOW DEPTH (FEET) = 4.32 TRAVEL TIME (MIN.) = 5.64  
 Tc (MIN.) = 72.47  
 SUBAREA AREA (ACRES) = 121.44 SUBAREA RUNOFF (CFS) = 108.75  
 EFFECTIVE AREA (ACRES) = 4391.87 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 4391.9 PEAK FLOW RATE (CFS) = 3970.39  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 100.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 4.29

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 4.29 FLOW VELOCITY (FEET/SEC.) = 7.90  
 LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11726.00 = 40229.41 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3094.31	43.14	1.617	0.30 ( 0.30)	0.99	2227.3	11701.00
2	3918.74	70.22	1.306	0.30 ( 0.30)	0.99	4274.7	11620.00
3	3970.39	72.47	1.291	0.30 ( 0.30)	0.99	4391.9	11600.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 3970.39 Tc (MIN.) = 72.47  
 AREA-AVERAGED Fm (INCH/HR) = 0.30 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA (ACRES) = 4391.87

=====

END OF STUDY SUMMARY:  
 TOTAL AREA (ACRES) = 4391.9 TC (MIN.) = 72.47  
 EFFECTIVE AREA (ACRES) = 4391.87 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.995  
 PEAK FLOW RATE (CFS) = 3970.39

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3094.31	43.14	1.617	0.30 ( 0.30)	0.99	2227.3	11701.00
2	3918.74	70.22	1.306	0.30 ( 0.30)	0.99	4274.7	11620.00
3	3970.39	72.47	1.291	0.30 ( 0.30)	0.99	4391.9	11600.00

=====

END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

-----  
FILE NAME: S18.DAT  
TIME/DATE OF STUDY: 11:52 04/03/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.454
- 2) 10.00; 4.074
- 3) 15.00; 3.117
- 4) 20.00; 2.536
- 5) 25.00; 2.180
- 6) 30.00; 1.944
- 7) 40.00; 1.686
- 8) 50.00; 1.448
- 9) 60.00; 1.366
- 10) 90.00; 1.168
- 11) 120.00; 1.033
- 12) 180.00; 0.874
- 13) 360.00; 0.661
- 14) 1440.00; 0.294

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11801.00 TO NODE 11802.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 970.31  
ELEVATION DATA: UPSTREAM(FEET) = 834.89 DOWNSTREAM(FEET) = 727.50

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 17.170  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.865  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 7.24 0.30 1.000 0 17.17  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 16.71  
TOTAL AREA (ACRES) = 7.24 PEAK FLOW RATE (CFS) = 16.71

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11802.00 TO NODE 11803.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 727.50 DOWNSTREAM(FEET) = 674.12  
CHANNEL LENGTH THRU SUBAREA(FEET) = 968.10 CHANNEL SLOPE = 0.0551  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.80  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.476  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN  
USER-DEFINED - 22.08 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 38.41  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.39  
AVERAGE FLOW DEPTH(FEET) = 0.76 TRAVEL TIME(MIN.) = 3.68  
Tc(MIN.) = 20.85  
SUBAREA AREA(ACRES) = 22.08 SUBAREA RUNOFF(CFS) = 43.24  
EFFECTIVE AREA(ACRES) = 29.32 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 29.3 PEAK FLOW RATE(CFS) = 57.41  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.96

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.96 FLOW VELOCITY(FEET/SEC.) = 5.03  
LONGEST FLOWPATH FROM NODE 11801.00 TO NODE 11803.00 = 1938.41 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11803.00 TO NODE 11804.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 674.12 DOWNSTREAM(FEET) = 554.40  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1864.27 CHANNEL SLOPE = 0.0642  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.21

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.133

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	35.55	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 86.81

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.05

AVERAGE FLOW DEPTH(FEET) = 1.16 TRAVEL TIME(MIN.) = 5.14

Tc(MIN.) = 25.99

SUBAREA AREA(ACRES) = 35.55 SUBAREA RUNOFF(CFS) = 58.66

EFFECTIVE AREA(ACRES) = 64.87 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 64.9 PEAK FLOW RATE(CFS) = 107.05

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.32 FLOW VELOCITY(FEET/SEC.) = 6.44

LONGEST FLOWPATH FROM NODE 11801.00 TO NODE 11804.00 = 3802.68 FEET.

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\*\*\*\*\*  
FLOW PROCESS FROM NODE 11804.00 TO NODE 11821.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 554.40 DOWNSTREAM(FEET) = 423.93  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1767.25 CHANNEL SLOPE = 0.0738  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.45

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.943

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	36.70	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 134.19

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.29

AVERAGE FLOW DEPTH(FEET) = 1.43 TRAVEL TIME(MIN.) = 4.04

Tc(MIN.) = 30.03

SUBAREA AREA(ACRES) = 36.70 SUBAREA RUNOFF(CFS) = 54.28

EFFECTIVE AREA(ACRES) = 101.57 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 101.6 PEAK FLOW RATE(CFS) = 150.22

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.53

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.53 FLOW VELOCITY(FEET/SEC.) = 7.53

LONGEST FLOWPATH FROM NODE 11801.00 TO NODE 11821.00 = 5569.93 FEET.

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\*\*\*\*\*  
FLOW PROCESS FROM NODE 11804.00 TO NODE 11821.00 IS CODE = 10  
-----

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

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\*\*\*\*\*  
FLOW PROCESS FROM NODE 11545.00 TO NODE 11726.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<<

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PEAK FLOWRATE TABLE FILE NAME: S15.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21540.85	36.80	0.30( 0.30)	1.00	7766.5	11500.00
2	21881.35	38.48	0.30( 0.30)	1.00	8316.5	11530.00
3	23058.13	45.25	0.30( 0.30)	1.00	10406.6	11000.00
4	25310.49	55.34	0.30( 0.30)	1.00	14693.9	11330.00
5	25720.18	57.69	0.30( 0.30)	1.00	15778.5	11350.00
6	25842.51	59.04	0.30( 0.30)	1.00	16415.7	10900.00
7	25910.30	60.56	0.30( 0.30)	1.00	17072.2	11300.00
8	25955.02	61.93	0.30( 0.30)	1.00	17644.9	11130.00
9	24958.83	73.77	0.30( 0.30)	1.00	21102.0	10600.00
10	24794.70	78.38	0.30( 0.30)	1.00	22478.2	11111.00
11	24746.84	79.28	0.30( 0.30)	1.00	22728.0	11201.00
12	24697.49	79.83	0.30( 0.30)	1.00	22860.2	11101.00
13	24499.74	84.59	0.30( 0.30)	1.00	23870.8	10710.00
14	24342.09	86.38	0.30( 0.30)	1.00	24174.9	10410.00
15	24035.11	90.69	0.30( 0.30)	1.00	24829.3	10700.00
16	23624.00	97.48	0.30( 0.30)	1.00	25795.7	10400.00
17	23416.61	99.42	0.30( 0.30)	1.00	26020.8	10200.00
18	22649.14	105.18	0.30( 0.30)	1.00	26582.4	10300.00
19	21798.17	110.61	0.30( 0.30)	1.00	26804.0	10210.00
20	19925.37	135.67	0.30( 0.30)	1.00	27497.1	10100.00
TOTAL AREA(ACRES) =						27497.1

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\*\*\*\*\*  
FLOW PROCESS FROM NODE 11725.00 TO NODE 11726.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 3 <<<<<

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PEAK FLOWRATE TABLE FILE NAME: S17.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3094.31	43.14	0.30( 0.30)	0.99	2227.3	11701.00
2	3918.74	70.22	0.30( 0.30)	0.99	4274.7	11620.00
3	3970.39	72.47	0.30( 0.30)	0.99	4391.9	11600.00
TOTAL AREA(ACRES) =						4391.9

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11725.00 TO NODE 11726.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3094.31	43.14	0.30( 0.30)	0.99	2227.3	11701.00
2	3918.74	70.22	0.30( 0.30)	0.99	4274.7	11620.00
3	3970.39	72.47	0.30( 0.30)	0.99	4391.9	11600.00
TOTAL AREA(ACRES) =						4391.9

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11545.00 TO NODE 11726.00 IS CODE = 11  
-----

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3094.31	43.14	1.611	0.30( 0.30)	0.99	2227.3	11701.00
2	3918.74	70.22	1.299	0.30( 0.30)	0.99	4274.7	11620.00
3	3970.39	72.47	1.284	0.30( 0.30)	0.99	4391.9	11600.00

LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11726.00 = 40229.41 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21540.85	36.80	1.769	0.30( 0.30)	1.00	7766.5	11500.00
2	21881.35	38.48	1.725	0.30( 0.30)	1.00	8316.5	11530.00
3	23058.13	45.25	1.561	0.30( 0.30)	1.00	10406.6	11000.00
4	25310.49	55.34	1.404	0.30( 0.30)	1.00	14693.9	11330.00
5	25720.18	57.69	1.385	0.30( 0.30)	1.00	15778.5	11350.00
6	25842.51	59.04	1.374	0.30( 0.30)	1.00	16415.7	10900.00
7	25910.30	60.56	1.362	0.30( 0.30)	1.00	17072.2	11300.00
8	25955.02	61.93	1.353	0.30( 0.30)	1.00	17644.9	11130.00
9	24958.83	73.77	1.275	0.30( 0.30)	1.00	21102.0	10600.00
10	24794.70	78.38	1.245	0.30( 0.30)	1.00	22478.2	11111.00
11	24746.84	79.28	1.239	0.30( 0.30)	1.00	22728.0	11201.00
12	24697.49	79.83	1.235	0.30( 0.30)	1.00	22860.2	11101.00
13	24499.74	84.59	1.204	0.30( 0.30)	1.00	23870.8	10710.00
14	24342.09	86.38	1.192	0.30( 0.30)	1.00	24174.9	10410.00
15	24035.11	90.69	1.165	0.30( 0.30)	1.00	24829.3	10700.00
16	23624.00	97.48	1.134	0.30( 0.30)	1.00	25795.7	10400.00
17	23416.61	99.42	1.126	0.30( 0.30)	1.00	26020.8	10200.00
18	22649.14	105.18	1.100	0.30( 0.30)	1.00	26582.4	10300.00
19	21798.17	110.61	1.075	0.30( 0.30)	1.00	26804.0	10210.00
20	19925.37	135.67	0.991	0.30( 0.30)	1.00	27497.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11726.00 = 89123.31 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24496.28	36.80	1.769	0.30( 0.30)	0.99	9666.0	11500.00

2	24880.71	38.48	1.725	0.30( 0.30)	0.99	10302.9	11530.00
3	25786.43	43.14	1.611	0.30( 0.30)	1.00	11983.8	11701.00
4	26216.58	45.25	1.561	0.30( 0.30)	1.00	12793.1	11000.00
5	28776.01	55.34	1.404	0.30( 0.30)	1.00	17843.1	11330.00
6	29257.29	57.69	1.385	0.30( 0.30)	1.00	19105.4	11350.00
7	29420.93	59.04	1.374	0.30( 0.30)	1.00	19845.2	10900.00
8	29534.78	60.56	1.362	0.30( 0.30)	1.00	20616.1	11300.00
9	29621.25	61.93	1.353	0.30( 0.30)	1.00	21292.5	11130.00
10	29176.31	70.22	1.299	0.30( 0.30)	1.00	24340.0	11620.00
11	29039.00	72.47	1.284	0.30( 0.30)	1.00	25112.9	11600.00
12	28894.51	73.77	1.275	0.30( 0.30)	1.00	25493.9	10600.00
13	28607.87	78.38	1.245	0.30( 0.30)	1.00	26870.0	11111.00
14	28535.95	79.28	1.239	0.30( 0.30)	1.00	27119.9	11201.00
15	28472.14	79.83	1.235	0.30( 0.30)	1.00	27252.1	11101.00
16	28147.84	84.59	1.204	0.30( 0.30)	1.00	28262.6	10710.00
17	27942.40	86.38	1.192	0.30( 0.30)	1.00	28566.8	10410.00
18	27526.69	90.69	1.165	0.30( 0.30)	1.00	29221.1	10700.00
19	26992.46	97.48	1.134	0.30( 0.30)	1.00	30187.6	10400.00
20	26750.04	99.42	1.126	0.30( 0.30)	1.00	30412.7	10200.00
21	25878.14	105.18	1.100	0.30( 0.30)	1.00	30974.3	10300.00
22	24928.63	110.61	1.075	0.30( 0.30)	1.00	31195.9	10210.00
23	22718.24	135.67	0.991	0.30( 0.30)	1.00	31889.0	10100.00

TOTAL AREA(ACRES) = 31889.0

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 29621.25 Tc(MIN.) = 61.927  
EFFECTIVE AREA(ACRES) = 21292.54 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 31889.0  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11726.00 = 89123.31 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11726.00 TO NODE 11821.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 436.21 DOWNSTREAM(FEET) = 423.93  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1621.39 CHANNEL SLOPE = 0.0076  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 13.22  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.341  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	59.69	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 29649.22  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.67  
AVERAGE FLOW DEPTH(FEET) = 13.22 TRAVEL TIME(MIN.) = 1.84  
Tc(MIN.) = 63.77  
SUBAREA AREA(ACRES) = 59.69 SUBAREA RUNOFF(CFS) = 55.93  
EFFECTIVE AREA(ACRES) = 21352.23 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 31948.7 PEAK FLOW RATE(CFS) = 29621.25  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE (FEET) = 100.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 13.21

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 13.21 FLOW VELOCITY (FEET/SEC.) = 14.67  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11804.00 TO NODE 11821.00 IS CODE = 11  
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>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24496.28	38.74	1.718	0.30 ( 0.30)	0.99	9725.7	11500.00
2	24880.71	40.41	1.676	0.30 ( 0.30)	0.99	10362.5	11530.00
3	25786.43	45.06	1.566	0.30 ( 0.30)	1.00	12043.5	11701.00
4	26216.58	47.16	1.516	0.30 ( 0.30)	1.00	12852.8	11000.00
5	28776.01	57.19	1.389	0.30 ( 0.30)	1.00	17902.8	11330.00
6	29257.29	59.53	1.370	0.30 ( 0.30)	1.00	19165.1	11350.00
7	29420.93	60.89	1.360	0.30 ( 0.30)	1.00	19904.9	10900.00
8	29534.78	62.40	1.350	0.30 ( 0.30)	1.00	20675.8	11300.00
9	29621.25	63.77	1.341	0.30 ( 0.30)	1.00	21352.2	11130.00
10	29176.31	72.07	1.286	0.30 ( 0.30)	1.00	24399.7	11620.00
11	29039.00	74.32	1.271	0.30 ( 0.30)	1.00	25172.6	11600.00
12	28894.51	75.63	1.263	0.30 ( 0.30)	1.00	25553.5	10600.00
13	28607.87	80.24	1.232	0.30 ( 0.30)	1.00	26929.7	11111.00
14	28535.95	81.15	1.226	0.30 ( 0.30)	1.00	27179.6	11201.00
15	28472.14	81.69	1.223	0.30 ( 0.30)	1.00	27311.8	11101.00
16	28147.84	86.46	1.191	0.30 ( 0.30)	1.00	28322.3	10710.00
17	27942.40	88.26	1.180	0.30 ( 0.30)	1.00	28626.5	10410.00
18	27526.69	92.57	1.156	0.30 ( 0.30)	1.00	29280.8	10700.00
19	26992.46	99.38	1.126	0.30 ( 0.30)	1.00	30247.3	10400.00
20	26750.04	101.31	1.117	0.30 ( 0.30)	1.00	30472.4	10200.00
21	25878.14	107.09	1.091	0.30 ( 0.30)	1.00	31034.0	10300.00
22	24928.63	112.55	1.067	0.30 ( 0.30)	1.00	31255.5	10210.00
23	22718.24	137.66	0.986	0.30 ( 0.30)	1.00	31948.7	10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.							

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	150.22	30.03	1.943	0.30 ( 0.30)	1.00	101.6	11801.00
LONGEST FLOWPATH FROM NODE 11801.00 TO NODE 11821.00 = 5569.93 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22142.56	30.03	1.943	0.30 ( 0.30)	0.99	7639.8	11801.00
2	24625.96	38.74	1.718	0.30 ( 0.30)	0.99	9827.3	11500.00
3	25006.51	40.41	1.676	0.30 ( 0.30)	0.99	10464.1	11530.00
4	25902.12	45.06	1.566	0.30 ( 0.30)	1.00	12145.0	11701.00
5	26327.71	47.16	1.516	0.30 ( 0.30)	1.00	12954.4	11000.00
6	28875.57	57.19	1.389	0.30 ( 0.30)	1.00	18004.3	11330.00
7	29355.09	59.53	1.370	0.30 ( 0.30)	1.00	19266.7	11350.00

8	29517.85	60.89	1.360	0.30 ( 0.30)	1.00	20006.5	10900.00
9	29630.79	62.40	1.350	0.30 ( 0.30)	1.00	20777.4	11300.00
10	29716.43	63.77	1.341	0.30 ( 0.30)	1.00	21453.8	11130.00
11	29266.48	72.07	1.286	0.30 ( 0.30)	1.00	24501.3	11620.00
12	29127.81	74.32	1.271	0.30 ( 0.30)	1.00	25274.1	11600.00
13	28982.53	75.63	1.263	0.30 ( 0.30)	1.00	25655.1	10600.00
14	28693.11	80.24	1.232	0.30 ( 0.30)	1.00	27031.3	11111.00
15	28620.64	81.15	1.226	0.30 ( 0.30)	1.00	27281.2	11201.00
16	28556.51	81.69	1.223	0.30 ( 0.30)	1.00	27413.4	11101.00
17	28229.33	86.46	1.191	0.30 ( 0.30)	1.00	28423.9	10710.00
18	28022.80	88.26	1.180	0.30 ( 0.30)	1.00	28728.1	10410.00
19	27604.99	92.57	1.156	0.30 ( 0.30)	1.00	29382.4	10700.00
20	27067.96	99.38	1.126	0.30 ( 0.30)	1.00	30348.8	10400.00
21	26824.74	101.31	1.117	0.30 ( 0.30)	1.00	30574.0	10200.00
22	25950.46	107.09	1.091	0.30 ( 0.30)	1.00	31135.6	10300.00
23	24998.71	112.55	1.067	0.30 ( 0.30)	1.00	31357.1	10210.00
24	22780.97	137.66	0.986	0.30 ( 0.30)	1.00	32050.3	10100.00
TOTAL AREA (ACRES) = 32050.3							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 29716.43 Tc (MIN.) = 63.769  
EFFECTIVE AREA (ACRES) = 21453.80 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 32050.3  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11821.00 TO NODE 11822.00 IS CODE = 56  
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>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 423.93 DOWNSTREAM (FEET) = 402.38  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1912.90 CHANNEL SLOPE = 0.0113  
GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 8.43  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.327  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	201.91	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 29809.73  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 14.61  
AVERAGE FLOW DEPTH (FEET) = 8.43 TRAVEL TIME (MIN.) = 2.18  
Tc (MIN.) = 65.95

SUBAREA AREA (ACRES) = 201.91 SUBAREA RUNOFF (CFS) = 186.59  
EFFECTIVE AREA (ACRES) = 21655.71 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 32252.2 PEAK FLOW RATE (CFS) = 29716.43  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 8.41

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.41 FLOW VELOCITY(FEET/SEC.) = 14.60  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11822.00 = 92657.60 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11822.00 TO NODE 11841.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 402.38 DOWNSTREAM(FEET) = 380.74  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2380.10 CHANNEL SLOPE = 0.0091  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.95

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.307

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	116.13	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 29769.08

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.60

AVERAGE FLOW DEPTH(FEET) = 8.95 TRAVEL TIME(MIN.) = 2.92

Tc(MIN.) = 68.87

SUBAREA AREA(ACRES) = 116.13 SUBAREA RUNOFF(CFS) = 105.30

EFFECTIVE AREA(ACRES) = 21771.85 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 32368.3 PEAK FLOW RATE(CFS) = 29716.43

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.94

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.94 FLOW VELOCITY(FEET/SEC.) = 13.59

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11841.00 = 95037.70 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11822.00 TO NODE 11841.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

-----  
TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 68.87

RAINFALL INTENSITY(INCH/HR) = 1.31

AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA(ACRES) = 21771.85

TOTAL STREAM AREA(ACRES) = 32368.29

PEAK FLOW RATE(CFS) AT CONFLUENCE = 29716.43

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11831.00 TO NODE 11832.00 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
INITIAL SUBAREA FLOW-LENGTH(FEET) = 248.20

ELEVATION DATA: UPSTREAM(FEET) = 1353.30 DOWNSTREAM(FEET) = 1280.02

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

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.179

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.941

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER						
"OPEN BRUSH"	-	0.76	0.30	1.000	0	8.18

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

SUBAREA RUNOFF(CFS) = 3.17

TOTAL AREA(ACRES) = 0.76 PEAK FLOW RATE(CFS) = 3.17

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11832.00 TO NODE 11833.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1280.02 DOWNSTREAM(FEET) = 1070.08  
CHANNEL LENGTH THRU SUBAREA(FEET) = 686.67 CHANNEL SLOPE = 0.3057  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.27

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.001

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	5.95	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 13.14

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.20

AVERAGE FLOW DEPTH(FEET) = 0.24 TRAVEL TIME(MIN.) = 2.20

Tc(MIN.) = 10.38

SUBAREA AREA(ACRES) = 5.95 SUBAREA RUNOFF(CFS) = 19.82

EFFECTIVE AREA(ACRES) = 6.71 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 6.7 PEAK FLOW RATE(CFS) = 22.35

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.33

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.33 FLOW VELOCITY(FEET/SEC.) = 6.30

LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11833.00 = 934.87 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11833.00 TO NODE 11834.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<



ELEVATION DATA: UPSTREAM(FEET) = 1070.08 DOWNSTREAM(FEET) = 913.56  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 977.36 CHANNEL SLOPE = 0.1601  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.73  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.562  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 23.21 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 56.55  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.10  
 AVERAGE FLOW DEPTH(FEET) = 0.70 TRAVEL TIME(MIN.) = 2.30  
 Tc(MIN.) = 12.68  
 SUBAREA AREA(ACRES) = 23.21 SUBAREA RUNOFF(CFS) = 68.14  
 EFFECTIVE AREA(ACRES) = 29.92 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 29.9 PEAK FLOW RATE(CFS) = 87.83  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.90  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.90 FLOW VELOCITY(FEET/SEC.) = 8.24  
 LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11834.00 = 1912.23 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11834.00 TO NODE 11835.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 913.56 DOWNSTREAM(FEET) = 727.99  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1875.63 CHANNEL SLOPE = 0.0989  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.64  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.972  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 73.73 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 176.92  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.75  
 AVERAGE FLOW DEPTH(FEET) = 1.54 TRAVEL TIME(MIN.) = 3.57  
 Tc(MIN.) = 16.25  
 SUBAREA AREA(ACRES) = 73.73 SUBAREA RUNOFF(CFS) = 177.32  
 EFFECTIVE AREA(ACRES) = 103.65 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 103.7 PEAK FLOW RATE(CFS) = 249.27  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.86

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.86 FLOW VELOCITY(FEET/SEC.) = 9.74  
 LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11835.00 = 3787.86 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11835.00 TO NODE 11836.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 727.99 DOWNSTREAM(FEET) = 611.39  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1896.64 CHANNEL SLOPE = 0.0615  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.60  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.566  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 93.31 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 344.64  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.04  
 AVERAGE FLOW DEPTH(FEET) = 2.53 TRAVEL TIME(MIN.) = 3.49  
 Tc(MIN.) = 19.74  
 SUBAREA AREA(ACRES) = 93.31 SUBAREA RUNOFF(CFS) = 190.30  
 EFFECTIVE AREA(ACRES) = 196.96 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 197.0 PEAK FLOW RATE(CFS) = 401.69  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.74

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.74 FLOW VELOCITY(FEET/SEC.) = 9.45  
 LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11836.00 = 5684.50 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11836.00 TO NODE 11837.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 611.39 DOWNSTREAM(FEET) = 508.59  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2178.15 CHANNEL SLOPE = 0.0472  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.31  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.270  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 98.92 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 489.47  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.08

AVERAGE FLOW DEPTH (FEET) = 3.26 TRAVEL TIME (MIN.) = 4.00  
Tc (MIN.) = 23.74  
SUBAREA AREA (ACRES) = 98.92 SUBAREA RUNOFF (CFS) = 175.36  
EFFECTIVE AREA (ACRES) = 295.88 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 295.9 PEAK FLOW RATE (CFS) = 524.53  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.38

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 3.38 FLOW VELOCITY (FEET/SEC.) = 9.25  
LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11837.00 = 7862.65 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11837.00 TO NODE 11838.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM (FEET) = 508.59 DOWNSTREAM (FEET) = 448.50  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1942.91 CHANNEL SLOPE = 0.0309  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 4.02  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.053  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	79.71	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 587.42  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.18  
AVERAGE FLOW DEPTH (FEET) = 3.99 TRAVEL TIME (MIN.) = 3.96  
Tc (MIN.) = 27.70

SUBAREA AREA (ACRES) = 79.71 SUBAREA RUNOFF (CFS) = 125.73  
EFFECTIVE AREA (ACRES) = 375.59 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 375.6 PEAK FLOW RATE (CFS) = 592.45  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 4.01

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 4.01 FLOW VELOCITY (FEET/SEC.) = 8.20  
LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11838.00 = 9805.56 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11838.00 TO NODE 11838.50 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM (FEET) = 448.50 DOWNSTREAM (FEET) = 420.79  
CHANNEL LENGTH THRU SUBAREA (FEET) = 917.65 CHANNEL SLOPE = 0.0302  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 4.12  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.965

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	34.57	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 618.35  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.24  
AVERAGE FLOW DEPTH (FEET) = 4.12 TRAVEL TIME (MIN.) = 1.86  
Tc (MIN.) = 29.56

SUBAREA AREA (ACRES) = 34.57 SUBAREA RUNOFF (CFS) = 51.80  
EFFECTIVE AREA (ACRES) = 410.16 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 410.2 PEAK FLOW RATE (CFS) = 614.63  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 4.11

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 4.11 FLOW VELOCITY (FEET/SEC.) = 8.22  
LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11838.50 = 10723.21 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11838.50 TO NODE 11841.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM (FEET) = 420.79 DOWNSTREAM (FEET) = 380.74  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1615.83 CHANNEL SLOPE = 0.0248  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 4.37  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.865  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	21.54	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 629.80  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.69  
AVERAGE FLOW DEPTH (FEET) = 4.37 TRAVEL TIME (MIN.) = 3.50  
Tc (MIN.) = 33.06

SUBAREA AREA (ACRES) = 21.54 SUBAREA RUNOFF (CFS) = 30.34  
EFFECTIVE AREA (ACRES) = 431.70 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 431.7 PEAK FLOW RATE (CFS) = 614.63  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 4.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 4.32 FLOW VELOCITY (FEET/SEC.) = 7.64  
LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11841.00 = 12339.04 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11838.50 TO NODE 11841.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 33.06
RAINFALL INTENSITY(INCH/HR) = 1.87
AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 431.70
TOTAL STREAM AREA(ACRES) = 431.70
PEAK FLOW RATE(CFS) AT CONFLUENCE = 614.63

\*\* CONFLUENCE DATA \*\*

Table with columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 25 rows of data.

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

\*\* PEAK FLOW RATE TABLE \*\*

Table with columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 5 rows of data.

Table with columns: Node, Q, Tc, Intensity, Fp, Ap, Ae, HEADWATER. Contains 25 rows of data.

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 30112.07 Tc(MIN.) = 68.87
EFFECTIVE AREA(ACRES) = 22203.54 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 32800.0
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11841.00 = 95037.70 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11841.00 TO NODE 12527.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 380.74 DOWNSTREAM(FEET) = 347.47
CHANNEL LENGTH THRU SUBAREA(FEET) = 2830.43 CHANNEL SLOPE = 0.0118
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040
\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.38
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.287
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 116.59 0.30 0.997 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.997
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 30163.88
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.88
AVERAGE FLOW DEPTH(FEET) = 8.38 TRAVEL TIME(MIN.) = 3.17
Tc(MIN.) = 72.04
SUBAREA AREA(ACRES) = 116.59 SUBAREA RUNOFF(CFS) = 103.62
EFFECTIVE AREA(ACRES) = 22320.13 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 32916.6 PEAK FLOW RATE(CFS) = 30112.07
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040
\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.37

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.37 FLOW VELOCITY(FEET/SEC.) = 14.87

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

=====  
 END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 32916.6 TC(MIN.) = 72.04

EFFECTIVE AREA(ACRES) = 22320.13 AREA-AVERAGED Fm(INCH/HR)= 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.997

PEAK FLOW RATE(CFS) = 30112.07

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22062.51	36.57	1.774	0.30( 0.30)	1.00	7927.3	11831.00
2	22730.92	39.13	1.708	0.30( 0.30)	1.00	8506.1	11801.00
3	25131.30	47.53	1.507	0.30( 0.30)	1.00	10693.6	11500.00
4	25496.47	49.16	1.468	0.30( 0.30)	1.00	11330.4	11530.00
5	26351.67	53.71	1.418	0.30( 0.30)	1.00	13011.4	11701.00
6	26770.60	55.76	1.401	0.30( 0.30)	1.00	13820.7	11000.00
7	29288.13	65.54	1.329	0.30( 0.30)	1.00	18870.7	11330.00
8	29761.65	67.84	1.314	0.30( 0.30)	1.00	20133.0	11350.00
9	29920.92	69.18	1.305	0.30( 0.30)	1.00	20872.8	10900.00
10	30029.97	70.68	1.296	0.30( 0.30)	1.00	21643.7	11300.00
11	30112.07	72.04	1.287	0.30( 0.30)	1.00	22320.1	11130.00
12	29640.54	80.38	1.231	0.30( 0.30)	1.00	25367.6	11620.00
13	29496.02	82.64	1.217	0.30( 0.30)	1.00	26140.5	11600.00
14	29347.33	83.97	1.208	0.30( 0.30)	1.00	26521.4	10600.00
15	29045.91	88.61	1.177	0.30( 0.30)	1.00	27897.6	11111.00
16	28971.08	89.52	1.171	0.30( 0.30)	1.00	28147.5	11201.00
17	28905.53	90.07	1.168	0.30( 0.30)	1.00	28279.7	11101.00
18	28567.30	94.87	1.146	0.30( 0.30)	1.00	29290.2	10710.00
19	28357.57	96.69	1.138	0.30( 0.30)	1.00	29594.4	10410.00
20	27932.08	101.05	1.118	0.30( 0.30)	1.00	30248.7	10700.00
21	27382.97	107.91	1.087	0.30( 0.30)	1.00	31215.2	10400.00
22	27136.30	109.87	1.079	0.30( 0.30)	1.00	31440.3	10200.00
23	26251.71	115.74	1.052	0.30( 0.30)	1.00	32001.9	10300.00
24	25290.20	121.31	1.030	0.30( 0.30)	1.00	32223.4	10210.00
25	23044.66	146.70	0.962	0.30( 0.30)	1.00	32916.6	10100.00

=====  
 END OF RATIONAL METHOD ANALYSIS

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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:

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FILE NAME: S19.DAT  
TIME/DATE OF STUDY: 10:23 09/12/2017  
=====

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--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.126
- 2) 10.00; 3.912
- 3) 15.00; 3.013
- 4) 20.00; 2.469
- 5) 25.00; 2.132
- 6) 30.00; 1.903
- 7) 40.00; 1.647
- 8) 50.00; 1.421
- 9) 60.00; 1.323
- 10) 90.00; 1.122
- 11) 120.00; 0.986
- 12) 180.00; 0.829
- 13) 360.00; 0.620
- 14) 1200.00; 0.273

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	STREETS FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11900.00 TO NODE 11901.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 295.79  
ELEVATION DATA: UPSTREAM(FEET) = 2369.48 DOWNSTREAM(FEET) = 2332.92

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.203  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.150  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL AREA Fp Ap SCS Tc  
GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
RESIDENTIAL  
".4 DWELLING/ACRE" - 1.62 0.30 0.999 0 7.20  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.999  
SUBAREA RUNOFF(CFS) = 7.07  
TOTAL AREA(ACRES) = 1.62 PEAK FLOW RATE(CFS) = 7.07

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11901.00 TO NODE 11902.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2332.92 DOWNSTREAM(FEET) = 2297.70  
CHANNEL LENGTH THRU SUBAREA(FEET) = 664.26 CHANNEL SLOPE = 0.0530  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.61  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.841  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL AREA Fp Ap SCS  
GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 8.35 0.30 0.906 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.906  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.63  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.47  
AVERAGE FLOW DEPTH(FEET) = 0.54 TRAVEL TIME(MIN.) = 3.19  
Tc(MIN.) = 10.39  
SUBAREA AREA(ACRES) = 8.35 SUBAREA RUNOFF(CFS) = 26.83  
EFFECTIVE AREA(ACRES) = 9.97 AREA-AVERAGED Fm(INCH/HR) = 0.28  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.92  
TOTAL AREA(ACRES) = 10.0 PEAK FLOW RATE(CFS) = 31.99  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.69

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.69 FLOW VELOCITY(FEET/SEC.) = 4.06  
LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11902.00 = 960.05 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11902.00 TO NODE 11902.50 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2297.70 DOWNSTREAM(FEET) = 2263.40  
CHANNEL LENGTH THRU SUBAREA(FEET) = 928.77 CHANNEL SLOPE = 0.0369  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.37

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.267

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	34.48	0.30	0.904	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.904

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 78.76

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.84

AVERAGE FLOW DEPTH(FEET) = 1.29 TRAVEL TIME(MIN.) = 3.20

Tc(MIN.) = 13.59

SUBAREA AREA(ACRES) = 34.48 SUBAREA RUNOFF(CFS) = 92.96

EFFECTIVE AREA(ACRES) = 44.45 AREA-AVERAGED Fm(INCH/HR) = 0.27

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.91

TOTAL AREA(ACRES) = 44.5 PEAK FLOW RATE(CFS) = 119.79

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.64

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.64 FLOW VELOCITY(FEET/SEC.) = 5.52

LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11902.50 = 1888.82 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11902.50 TO NODE 11903.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2263.40 DOWNSTREAM(FEET) = 2252.14  
CHANNEL LENGTH THRU SUBAREA(FEET) = 895.50 CHANNEL SLOPE = 0.0126

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.49

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.762

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	23.65	0.30	0.958	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.958

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 146.17

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.02

AVERAGE FLOW DEPTH(FEET) = 2.44 TRAVEL TIME(MIN.) = 3.72

Tc(MIN.) = 17.31

SUBAREA AREA(ACRES) = 23.65 SUBAREA RUNOFF(CFS) = 52.68

EFFECTIVE AREA(ACRES) = 68.10 AREA-AVERAGED Fm(INCH/HR) = 0.28

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.93

TOTAL AREA(ACRES) = 68.1 PEAK FLOW RATE(CFS) = 152.29

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.50

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.50 FLOW VELOCITY(FEET/SEC.) = 4.06

LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11903.00 = 2784.32 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11903.00 TO NODE 11904.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2252.14 DOWNSTREAM(FEET) = 2186.04

CHANNEL LENGTH THRU SUBAREA(FEET) = 1924.35 CHANNEL SLOPE = 0.0343

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.38

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.314

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	68.53	0.30	0.961	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.961

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 214.93

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.42

AVERAGE FLOW DEPTH(FEET) = 2.29 TRAVEL TIME(MIN.) = 4.99

Tc(MIN.) = 22.30

SUBAREA AREA(ACRES) = 68.53 SUBAREA RUNOFF(CFS) = 124.95

EFFECTIVE AREA(ACRES) = 136.63 AREA-AVERAGED Fm(INCH/HR) = 0.28

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.94

TOTAL AREA(ACRES) = 136.6 PEAK FLOW RATE(CFS) = 249.78

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.49

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.49 FLOW VELOCITY(FEET/SEC.) = 6.70

LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11904.00 = 4708.67 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11904.00 TO NODE 11905.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2186.04 DOWNSTREAM(FEET) = 1957.34

CHANNEL LENGTH THRU SUBAREA(FEET) = 1926.87 CHANNEL SLOPE = 0.1187

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.99

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.122

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	63.15	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 301.58  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.97  
 AVERAGE FLOW DEPTH(FEET) = 1.97 TRAVEL TIME(MIN.) = 2.93  
 Tc(MIN.) = 25.22  
 SUBAREA AREA(ACRES) = 63.15 SUBAREA RUNOFF(CFS) = 103.54  
 EFFECTIVE AREA(ACRES) = 199.78 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA(ACRES) = 199.8 PEAK FLOW RATE(CFS) = 329.66  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.07

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.07 FLOW VELOCITY(FEET/SEC.) = 11.26  
 LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11905.00 = 6635.54 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11905.00 TO NODE 11906.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1957.34 DOWNSTREAM(FEET) = 1244.16  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2498.96 CHANNEL SLOPE = 0.2854  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.81  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.004

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	84.87	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 394.76  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.17  
 AVERAGE FLOW DEPTH(FEET) = 1.80 TRAVEL TIME(MIN.) = 2.58  
 Tc(MIN.) = 27.80  
 SUBAREA AREA(ACRES) = 84.87 SUBAREA RUNOFF(CFS) = 130.15  
 EFFECTIVE AREA(ACRES) = 284.65 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 284.6 PEAK FLOW RATE(CFS) = 438.60  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.90

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.90 FLOW VELOCITY(FEET/SEC.) = 16.70  
 LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11906.00 = 9134.50 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11906.00 TO NODE 11920.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1244.16 DOWNSTREAM(FEET) = 873.95  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 3370.75 CHANNEL SLOPE = 0.1098  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.89  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.848

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	199.43	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 577.59  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.91  
 AVERAGE FLOW DEPTH(FEET) = 2.85 TRAVEL TIME(MIN.) = 4.35  
 Tc(MIN.) = 32.15  
 SUBAREA AREA(ACRES) = 199.43 SUBAREA RUNOFF(CFS) = 277.84  
 EFFECTIVE AREA(ACRES) = 484.08 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98  
 TOTAL AREA(ACRES) = 484.1 PEAK FLOW RATE(CFS) = 676.50  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.10

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.10 FLOW VELOCITY(FEET/SEC.) = 13.47  
 LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11920.00 = 12505.25 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11906.00 TO NODE 11920.00 IS CODE = 1

-----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 32.15  
 RAINFALL INTENSITY(INCH/HR) = 1.85  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.98  
 EFFECTIVE STREAM AREA(ACRES) = 484.08  
 TOTAL STREAM AREA(ACRES) = 484.08  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 676.50

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11910.00 TO NODE 11911.00 IS CODE = 21

-----  
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 517.62  
 ELEVATION DATA: UPSTREAM(FEET) = 2531.88 DOWNSTREAM(FEET) = 2441.33

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.185  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.519  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc
USER-DEFINED	-	199.43	0.30	1.000	-	

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
 NATURAL FAIR COVER  
 "CHAPARRAL,BROADLEAF" - 3.46 0.30 1.000 0 12.19  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 10.02  
 TOTAL AREA(ACRES) = 3.46 PEAK FLOW RATE(CFS) = 10.02

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11911.00 TO NODE 11912.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2441.33 DOWNSTREAM(FEET) = 2382.20  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 397.30 CHANNEL SLOPE = 0.1488  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.37  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.259

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 5.79 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 17.74  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.58  
 AVERAGE FLOW DEPTH(FEET) = 0.36 TRAVEL TIME(MIN.) = 1.45  
 Tc(MIN.) = 13.63  
 SUBAREA AREA(ACRES) = 5.79 SUBAREA RUNOFF(CFS) = 15.42  
 EFFECTIVE AREA(ACRES) = 9.25 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 9.2 PEAK FLOW RATE(CFS) = 24.63  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.44

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.44 FLOW VELOCITY(FEET/SEC.) = 5.17  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11912.00 = 914.92 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11912.00 TO NODE 11913.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2382.20 DOWNSTREAM(FEET) = 2263.77  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1891.47 CHANNEL SLOPE = 0.0626  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.25  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.578

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 54.30 0.30 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 81.08  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.88  
 AVERAGE FLOW DEPTH(FEET) = 1.13 TRAVEL TIME(MIN.) = 5.37  
 Tc(MIN.) = 19.00  
 SUBAREA AREA(ACRES) = 54.30 SUBAREA RUNOFF(CFS) = 111.33  
 EFFECTIVE AREA(ACRES) = 63.55 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 63.5 PEAK FLOW RATE(CFS) = 130.30  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.48

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.48 FLOW VELOCITY(FEET/SEC.) = 6.81  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11913.00 = 2806.39 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11913.00 TO NODE 11914.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2263.77 DOWNSTREAM(FEET) = 1845.23  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1957.31 CHANNEL SLOPE = 0.2138  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.32  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.348

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 65.14 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 190.42  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.69  
 AVERAGE FLOW DEPTH(FEET) = 1.29 TRAVEL TIME(MIN.) = 2.79  
 Tc(MIN.) = 21.79  
 SUBAREA AREA(ACRES) = 65.14 SUBAREA RUNOFF(CFS) = 120.10  
 EFFECTIVE AREA(ACRES) = 128.69 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 128.7 PEAK FLOW RATE(CFS) = 237.27  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.46

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.46 FLOW VELOCITY(FEET/SEC.) = 12.56  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11914.00 = 4763.70 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11914.00 TO NODE 11915.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<



ELEVATION DATA: UPSTREAM(FEET) = 1845.23 DOWNSTREAM(FEET) = 1557.21  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1686.78 CHANNEL SLOPE = 0.1708  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.81  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.197  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 78.52 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 304.32  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.52  
 AVERAGE FLOW DEPTH(FEET) = 1.79 TRAVEL TIME(MIN.) = 2.25  
 Tc(MIN.) = 24.03  
 SUBAREA AREA(ACRES) = 78.52 SUBAREA RUNOFF(CFS) = 134.07  
 EFFECTIVE AREA(ACRES) = 207.21 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 207.2 PEAK FLOW RATE(CFS) = 353.81  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.95  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.95 FLOW VELOCITY(FEET/SEC.) = 13.07  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11915.00 = 6450.48 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11915.00 TO NODE 11916.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 1557.21 DOWNSTREAM(FEET) = 1403.38  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1909.39 CHANNEL SLOPE = 0.0806  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.60  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.037  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 70.48 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 408.91  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.45  
 AVERAGE FLOW DEPTH(FEET) = 2.58 TRAVEL TIME(MIN.) = 3.05  
 Tc(MIN.) = 27.08  
 SUBAREA AREA(ACRES) = 70.48 SUBAREA RUNOFF(CFS) = 110.17  
 EFFECTIVE AREA(ACRES) = 277.69 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 277.7 PEAK FLOW RATE(CFS) = 434.06  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.66

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.66 FLOW VELOCITY(FEET/SEC.) = 10.65  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11916.00 = 8359.87 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11916.00 TO NODE 11917.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 1403.38 DOWNSTREAM(FEET) = 1079.99  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1945.82 CHANNEL SLOPE = 0.1662  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.64  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.939  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 232.20 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 605.35  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.16  
 AVERAGE FLOW DEPTH(FEET) = 2.62 TRAVEL TIME(MIN.) = 2.14  
 Tc(MIN.) = 29.22  
 SUBAREA AREA(ACRES) = 232.20 SUBAREA RUNOFF(CFS) = 342.49  
 EFFECTIVE AREA(ACRES) = 509.89 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 509.9 PEAK FLOW RATE(CFS) = 752.07  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.94  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.94 FLOW VELOCITY(FEET/SEC.) = 16.11  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11917.00 = 10305.69 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11917.00 TO NODE 11920.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 1079.99 DOWNSTREAM(FEET) = 873.95  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2563.91 CHANNEL SLOPE = 0.0804  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.74  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.837  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 110.82 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 828.73  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.74

AVERAGE FLOW DEPTH (FEET) = 3.73 TRAVEL TIME (MIN.) = 3.36  
 Tc (MIN.) = 32.57  
 SUBAREA AREA (ACRES) = 110.82 SUBAREA RUNOFF (CFS) = 153.31  
 EFFECTIVE AREA (ACRES) = 620.71 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 620.7 PEAK FLOW RATE (CFS) = 858.72  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 3.80

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 3.80 FLOW VELOCITY (FEET/SEC.) = 12.86  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11920.00 = 12869.60 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11917.00 TO NODE 11920.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

\*\*\*\*\*  
 TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION (MIN.) = 32.57  
 RAINFALL INTENSITY (INCH/HR) = 1.84  
 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA (ACRES) = 620.71  
 TOTAL STREAM AREA (ACRES) = 620.71  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 858.72

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	676.50	32.15	1.848	0.30 (0.30)	0.98	484.1	11900.00
2	858.72	32.57	1.837	0.30 (0.30)	1.00	620.7	11910.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1530.06	32.15	1.848	0.30 (0.30)	0.99	1096.8	11900.00
2	1530.52	32.57	1.837	0.30 (0.30)	0.99	1104.8	11910.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE (CFS) = 1530.52 Tc (MIN.) = 32.57  
 EFFECTIVE AREA (ACRES) = 1104.79 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 1104.8  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11920.00 = 12869.60 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11920.00 TO NODE 11921.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

\*\*\*\*\*  
 ELEVATION DATA: UPSTREAM (FEET) = 873.95 DOWNSTREAM (FEET) = 827.94  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1417.25 CHANNEL SLOPE = 0.0325  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.45  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.781  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 107.47 0.30 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1602.17  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.86  
 AVERAGE FLOW DEPTH (FEET) = 6.44 TRAVEL TIME (MIN.) = 2.17  
 Tc (MIN.) = 34.75  
 SUBAREA AREA (ACRES) = 107.47 SUBAREA RUNOFF (CFS) = 143.30  
 EFFECTIVE AREA (ACRES) = 1212.26 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 1212.3 PEAK FLOW RATE (CFS) = 1618.46  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.47

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 6.47 FLOW VELOCITY (FEET/SEC.) = 10.89  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11921.00 = 14286.85 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1619.45	34.33	1.792	0.30 (0.30)	0.99	1204.2	11900.00
2	1618.46	34.75	1.781	0.30 (0.30)	0.99	1212.3	11910.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 1619.45 Tc (MIN.) = 34.33  
 AREA-AVERAGED Fm (INCH/HR) = 0.30 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA (ACRES) = 1204.23

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11921.00 TO NODE 11922.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

\*\*\*\*\*  
 ELEVATION DATA: UPSTREAM (FEET) = 827.94 DOWNSTREAM (FEET) = 753.55  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1886.43 CHANNEL SLOPE = 0.0394  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.59  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.726  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	344.27	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1840.35

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.10  
 AVERAGE FLOW DEPTH (FEET) = 6.57 TRAVEL TIME (MIN.) = 2.60  
 Tc (MIN.) = 36.93  
 SUBAREA AREA (ACRES) = 344.27 SUBAREA RUNOFF (CFS) = 441.77  
 EFFECTIVE AREA (ACRES) = 1548.50 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 1556.5 PEAK FLOW RATE (CFS) = 1989.13  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.82

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 6.82 FLOW VELOCITY (FEET/SEC.) = 12.35  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11922.00 = 16173.28 FEET.

\*\* PEAK FLOW RATE TABLE \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1989.13	36.93	1.726	0.30 (0.30)	0.99	1548.5	11900.00
2	1984.30	37.35	1.715	0.30 (0.30)	1.00	1556.5	11910.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 1989.13 Tc (MIN.) = 36.93  
 AREA-AVERAGED Fm (INCH/HR) = 0.30 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA (ACRES) = 1548.50

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11922.00 TO NODE 11923.00 IS CODE = 56

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>> TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 753.55 DOWNSTREAM (FEET) = 641.58  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2860.88 CHANNEL SLOPE = 0.0391  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 7.00  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.630  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	165.18	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2088.00  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.47  
 AVERAGE FLOW DEPTH (FEET) = 6.99 TRAVEL TIME (MIN.) = 3.82  
 Tc (MIN.) = 40.75  
 SUBAREA AREA (ACRES) = 165.18 SUBAREA RUNOFF (CFS) = 197.74  
 EFFECTIVE AREA (ACRES) = 1713.68 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 1721.7 PEAK FLOW RATE (CFS) = 2053.57  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.93

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 6.93 FLOW VELOCITY (FEET/SEC.) = 12.42  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11923.00 = 19034.16 FEET.

\*\* PEAK FLOW RATE TABLE \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2053.57	40.75	1.630	0.30 (0.30)	1.00	1713.7	11900.00
2	2048.35	41.17	1.620	0.30 (0.30)	1.00	1721.7	11910.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 2053.57 Tc (MIN.) = 40.75  
 AREA-AVERAGED Fm (INCH/HR) = 0.30 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA (ACRES) = 1713.68

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11923.00 TO NODE 11924.00 IS CODE = 56

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>> TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 641.58 DOWNSTREAM (FEET) = 579.89  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1844.02 CHANNEL SLOPE = 0.0335  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 7.60  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.573  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	433.73	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2301.96  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.07  
 AVERAGE FLOW DEPTH (FEET) = 7.58 TRAVEL TIME (MIN.) = 2.55  
 Tc (MIN.) = 43.30  
 SUBAREA AREA (ACRES) = 433.73 SUBAREA RUNOFF (CFS) = 496.76  
 EFFECTIVE AREA (ACRES) = 2147.41 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 2155.4 PEAK FLOW RATE (CFS) = 2461.56  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 7.82

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 7.82 FLOW VELOCITY (FEET/SEC.) = 12.27  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11924.00 = 20878.18 FEET.

\*\* PEAK FLOW RATE TABLE \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2461.56	43.30	1.573	0.30 (0.30)	1.00	2147.4	11900.00
2	2452.07	43.72	1.563	0.30 (0.30)	1.00	2155.4	11910.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 2461.56 Tc (MIN.) = 43.30  
 AREA-AVERAGED Fm (INCH/HR) = 0.30 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA (ACRES) = 2147.41

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 FLOW PROCESS FROM NODE 11924.00 TO NODE 11925.00 IS CODE = 56

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 579.89 DOWNSTREAM(FEET) = 494.12
CHANNEL LENGTH THRU SUBAREA(FEET) = 2756.15 CHANNEL SLOPE = 0.0311
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 8.18
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.487
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 265.42 0.30 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2603.34
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.12
AVERAGE FLOW DEPTH(FEET) = 8.16 TRAVEL TIME(MIN.) = 3.79
Tc(MIN.) = 47.09
SUBAREA AREA(ACRES) = 265.42 SUBAREA RUNOFF(CFS) = 283.53
EFFECTIVE AREA(ACRES) = 2412.83 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 2420.9 PEAK FLOW RATE(CFS) = 2579.55
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 8.13

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 8.13 FLOW VELOCITY(FEET/SEC.) = 12.09
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11925.00 = 23634.33 FEET.

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** PEAK FLOW RATE TABLE **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 2579.55 47.09 1.487 0.30( 0.30) 1.00 2412.8 11900.00
2 2566.93 47.52 1.477 0.30( 0.30) 1.00 2420.9 11910.00
NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 2579.55 Tc(MIN.) = 47.09
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 2412.83

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FLOW PROCESS FROM NODE 11925.00 TO NODE 11926.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 494.12 DOWNSTREAM(FEET) = 458.40
CHANNEL LENGTH THRU SUBAREA(FEET) = 1922.70 CHANNEL SLOPE = 0.0186
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.23
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.418
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 97.46 0.30 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30

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SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2628.59
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.03
AVERAGE FLOW DEPTH(FEET) = 9.22 TRAVEL TIME(MIN.) = 3.20
Tc(MIN.) = 50.28
SUBAREA AREA(ACRES) = 97.46 SUBAREA RUNOFF(CFS) = 98.09
EFFECTIVE AREA(ACRES) = 2510.29 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 2518.3 PEAK FLOW RATE(CFS) = 2579.55
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.14

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 9.14 FLOW VELOCITY(FEET/SEC.) = 9.97
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11926.00 = 25557.03 FEET.

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** PEAK FLOW RATE TABLE **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 2579.55 50.28 1.418 0.30( 0.30) 1.00 2510.3 11900.00
2 2566.93 50.72 1.414 0.30( 0.30) 1.00 2518.3 11910.00
NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 2579.55 Tc(MIN.) = 50.28
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 2510.29

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FLOW PROCESS FROM NODE 11926.00 TO NODE 11927.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 458.40 DOWNSTREAM(FEET) = 399.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 2170.13 CHANNEL SLOPE = 0.0274
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 8.41
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.388
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 53.83 0.30 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2605.89
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.55
AVERAGE FLOW DEPTH(FEET) = 8.41 TRAVEL TIME(MIN.) = 3.13
Tc(MIN.) = 53.41
SUBAREA AREA(ACRES) = 53.83 SUBAREA RUNOFF(CFS) = 52.69
EFFECTIVE AREA(ACRES) = 2564.12 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 2572.1 PEAK FLOW RATE(CFS) = 2579.55
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 8.37

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 8.37 FLOW VELOCITY(FEET/SEC.) = 11.53  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11927.00 = 27727.16 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2579.55	53.41	1.388	0.30( 0.30)	1.00	2564.1	11900.00
2	2566.93	53.85	1.383	0.30( 0.30)	1.00	2572.1	11910.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 2579.55 Tc(MIN.) = 53.41  
 AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 2564.12

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11927.00 TO NODE 11927.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610401Y.DNA  
 MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1112.52	23.88	0.30( 0.30)	1.00	620.7	40120.00
2	1103.67	25.69	0.30( 0.30)	1.00	652.1	40100.00
TOTAL AREA(ACRES) = 652.1						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11927.00 TO NODE 11927.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2579.55	53.41	1.388	0.30( 0.30)	1.00	2564.1	11900.00
2	2566.93	53.85	1.383	0.30( 0.30)	1.00	2572.1	11910.00

LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11927.00 = 27727.16 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1112.52	23.88	2.207	0.30( 0.30)	1.00	620.7	40120.00
2	1103.67	25.69	2.100	0.30( 0.30)	1.00	652.1	40100.00

LONGEST FLOWPATH FROM NODE 40100.00 TO NODE 11927.00 = 10245.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3134.55	23.88	2.207	0.30( 0.30)	1.00	1767.3	40120.00
2	3156.82	25.69	2.100	0.30( 0.30)	1.00	1885.3	40100.00
3	3246.24	53.41	1.388	0.30( 0.30)	1.00	3216.2	11900.00
4	3231.00	53.85	1.383	0.30( 0.30)	1.00	3224.2	11910.00
TOTAL AREA(ACRES) = 3224.2							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 3246.24 Tc(MIN.) = 53.413  
 EFFECTIVE AREA(ACRES) = 3216.18 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 3224.2  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11927.00 = 27727.16 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11927.00 TO NODE 11927.50 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 399.00 DOWNSTREAM(FEET) = 384.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 986.26 CHANNEL SLOPE = 0.0152  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 10.60  
 CHANNEL FLOW THRU SUBAREA(CFS) = 3246.24  
 FLOW VELOCITY(FEET/SEC.) = 9.82 FLOW DEPTH(FEET) = 10.60  
 TRAVEL TIME(MIN.) = 1.67 Tc(MIN.) = 55.09  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11927.50 = 28713.42 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3134.55	25.57	2.106	0.30( 0.30)	1.00	1767.3	40120.00
2	3156.82	27.38	2.023	0.30( 0.30)	1.00	1885.3	40100.00
3	3246.24	55.09	1.371	0.30( 0.30)	1.00	3216.2	11900.00
4	3231.00	55.53	1.367	0.30( 0.30)	1.00	3224.2	11910.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 3246.24 Tc(MIN.) = 55.09  
 AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 3216.18

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11927.50 TO NODE 11927.50 IS CODE = 12  
 -----

>>>>CLEAR MEMORY BANK # 1 <<<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11927.50 TO NODE 11927.50 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 1 <<<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610402Y.DNA  
 MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	90.15	13.36	0.30( 0.30)	1.00	33.3	40200.00
TOTAL AREA(ACRES) = 33.3						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11927.50 TO NODE 11927.50 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3134.55	25.57	2.106	0.30 ( 0.30)	1.00	1767.3	40120.00
2	3156.82	27.38	2.023	0.30 ( 0.30)	1.00	1885.3	40100.00
3	3246.24	55.09	1.371	0.30 ( 0.30)	1.00	3216.2	11900.00
4	3231.00	55.53	1.367	0.30 ( 0.30)	1.00	3224.2	11910.00

LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11927.50 = 28713.42 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	90.15	13.36	3.307	0.30 ( 0.30)	1.00	33.3	40200.00

LONGEST FLOWPATH FROM NODE 40200.00 TO NODE 11927.50 = 1999.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2817.53	13.36	3.307	0.30 ( 0.30)	1.00	956.7	40200.00
2	3188.68	25.57	2.106	0.30 ( 0.30)	1.00	1800.6	40120.00
3	3208.47	27.38	2.023	0.30 ( 0.30)	1.00	1918.6	40100.00
4	3278.35	55.09	1.371	0.30 ( 0.30)	1.00	3249.5	11900.00
5	3262.97	55.53	1.367	0.30 ( 0.30)	1.00	3257.5	11910.00

TOTAL AREA (ACRES) = 3257.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 3278.35 Tc (MIN.) = 55.088  
 EFFECTIVE AREA (ACRES) = 3249.50 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 3257.5  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11927.50 = 28713.42 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11927.50 TO NODE 11928.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 384.00 DOWNSTREAM (FEET) = 359.00  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 647.19 CHANNEL SLOPE = 0.0386  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 8.68  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.364

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	78.01	0.30	0.984	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.984  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 3315.85  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 13.97  
 AVERAGE FLOW DEPTH (FEET) = 8.68 TRAVEL TIME (MIN.) = 0.77  
 Tc (MIN.) = 55.86  
 SUBAREA AREA (ACRES) = 78.01 SUBAREA RUNOFF (CFS) = 75.01  
 EFFECTIVE AREA (ACRES) = 3327.51 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 3335.5 PEAK FLOW RATE (CFS) = 3278.35

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 8.63

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 8.63 FLOW VELOCITY (FEET/SEC.) = 13.93  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11928.00 = 29360.61 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2817.53	14.16	3.164	0.30 ( 0.30)	1.00	1034.7	40200.00
2	3188.68	26.35	2.070	0.30 ( 0.30)	1.00	1878.6	40120.00
3	3208.47	28.15	1.988	0.30 ( 0.30)	1.00	1996.6	40100.00
4	3278.35	55.86	1.364	0.30 ( 0.30)	1.00	3327.5	11900.00
5	3262.97	56.30	1.359	0.30 ( 0.30)	1.00	3335.5	11910.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 3278.35 Tc (MIN.) = 55.86  
 AREA-AVERAGED Fm (INCH/HR) = 0.30 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA (ACRES) = 3327.51

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11928.00 TO NODE 11929.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 359.00 DOWNSTREAM (FEET) = 341.63  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1322.66 CHANNEL SLOPE = 0.0131  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 11.00  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.340

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	8.18	0.30	0.890	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.890  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 3282.30  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.32  
 AVERAGE FLOW DEPTH (FEET) = 11.00 TRAVEL TIME (MIN.) = 2.37  
 Tc (MIN.) = 58.23  
 SUBAREA AREA (ACRES) = 8.18 SUBAREA RUNOFF (CFS) = 7.90  
 EFFECTIVE AREA (ACRES) = 3335.69 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 3343.7 PEAK FLOW RATE (CFS) = 3278.35

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 11.00

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 11.00 FLOW VELOCITY (FEET/SEC.) = 9.32  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11929.00 = 30683.27 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2817.53	16.62	2.837	0.30( 0.30)	1.00	1042.9	40200.00
2	3188.68	28.73	1.961	0.30( 0.30)	1.00	1886.8	40120.00
3	3208.47	30.53	1.889	0.30( 0.30)	1.00	2004.8	40100.00
4	3278.35	58.23	1.340	0.30( 0.30)	1.00	3335.7	11900.00
5	3262.97	58.67	1.336	0.30( 0.30)	1.00	3343.7	11910.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 3278.35 Tc(MIN.) = 58.23  
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 3335.69

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11928.00 TO NODE 11929.00 IS CODE = 10  
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>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<<  
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FLOW PROCESS FROM NODE 11841.00 TO NODE 11527.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 1 <<<<<<  
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\*\*\*\*\*  
FLOW PROCESS FROM NODE 11841.00 TO NODE 12527.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<<  
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PEAK FLOWRATE TABLE FILE NAME: S18.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22062.51	36.57	0.30( 0.30)	1.00	7927.3	11831.00
2	22730.92	39.13	0.30( 0.30)	1.00	8506.1	11801.00
3	25131.30	47.53	0.30( 0.30)	1.00	10693.6	11500.00
4	25496.47	49.16	0.30( 0.30)	1.00	11330.4	11530.00
5	26351.67	53.71	0.30( 0.30)	1.00	13011.4	11701.00
6	26770.60	55.76	0.30( 0.30)	1.00	13820.7	11000.00
7	29288.13	65.54	0.30( 0.30)	1.00	18870.7	11330.00
8	30112.07	72.04	0.30( 0.30)	1.00	22320.1	11130.00
9	29640.54	80.38	0.30( 0.30)	1.00	25367.6	11620.00
10	29496.02	82.64	0.30( 0.30)	1.00	26140.5	11600.00
11	29045.91	88.61	0.30( 0.30)	1.00	27897.6	11111.00
12	28905.53	90.07	0.30( 0.30)	1.00	28279.7	11101.00
13	28567.30	94.87	0.30( 0.30)	1.00	29290.2	10710.00
14	28357.57	96.69	0.30( 0.30)	1.00	29594.4	10410.00
15	27932.08	101.05	0.30( 0.30)	1.00	30248.7	10700.00
16	27382.97	107.91	0.30( 0.30)	1.00	31215.2	10400.00
17	27136.30	109.87	0.30( 0.30)	1.00	31440.3	10200.00
18	26251.71	115.74	0.30( 0.30)	1.00	32001.9	10300.00
19	25290.20	121.31	0.30( 0.30)	1.00	32223.4	10210.00
20	23044.66	146.70	0.30( 0.30)	1.00	32916.6	10100.00

TOTAL AREA(ACRES) = 32916.6

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 2 <<<<<<  
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\*\*\*MEMORY BANK # 2 IS EMPTY - PROCESS IGNORED.\*\*\*

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FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 2 <<<<<<  
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PEAK FLOWRATE TABLE FILE NAME: S25.DNA  
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7546.62	65.16	0.30( 0.30)	0.99	6428.1	12500.00
2	8478.81	78.31	0.30( 0.30)	0.99	8413.0	12300.00
3	8594.46	79.61	0.30( 0.30)	0.98	8690.7	12330.00
4	8774.76	82.21	0.30( 0.30)	0.98	9202.8	12410.00
5	9008.99	86.22	0.30( 0.29)	0.98	9925.0	12400.00
6	9222.81	90.84	0.30( 0.29)	0.98	10622.3	12211.00
7	9349.15	94.81	0.30( 0.29)	0.98	11208.8	12201.00
8	9386.85	98.70	0.30( 0.29)	0.98	11677.1	12111.00
9	9369.11	101.16	0.30( 0.29)	0.98	11978.2	12231.00
10	9321.96	103.97	0.30( 0.29)	0.98	12282.5	12101.10
11	9302.16	104.81	0.30( 0.29)	0.98	12363.6	12261.00
12	8944.23	115.65	0.30( 0.29)	0.98	13112.3	12010.00
13	8608.51	123.88	0.30( 0.29)	0.98	13237.1	12000.00

TOTAL AREA(ACRES) = 13237.1

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FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 14.0  
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>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
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MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7546.62	65.16	0.30( 0.30)	0.99	6428.1	12500.00
2	8478.81	78.31	0.30( 0.30)	0.99	8413.0	12300.00
3	8594.46	79.61	0.30( 0.30)	0.98	8690.7	12330.00
4	8774.76	82.21	0.30( 0.30)	0.98	9202.8	12410.00
5	9008.99	86.22	0.30( 0.29)	0.98	9925.0	12400.00
6	9222.81	90.84	0.30( 0.29)	0.98	10622.3	12211.00
7	9349.15	94.81	0.30( 0.29)	0.98	11208.8	12201.00
8	9386.85	98.70	0.30( 0.29)	0.98	11677.1	12111.00
9	9369.11	101.16	0.30( 0.29)	0.98	11978.2	12231.00
10	9321.96	103.97	0.30( 0.29)	0.98	12282.5	12101.10
11	9302.16	104.81	0.30( 0.29)	0.98	12363.6	12261.00
12	8944.23	115.65	0.30( 0.29)	0.98	13112.3	12010.00
13	8608.51	123.88	0.30( 0.29)	0.98	13237.1	12000.00

TOTAL AREA(ACRES) = 13237.1

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FLOW PROCESS FROM NODE 11841.00 TO NODE 12527.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7546.62	65.16	1.288	0.30 ( 0.30)	0.99	6428.1	12500.00
2	8478.81	78.31	1.200	0.30 ( 0.30)	0.99	8413.0	12300.00
3	8594.46	79.61	1.192	0.30 ( 0.30)	0.98	8690.7	12330.00
4	8774.76	82.21	1.174	0.30 ( 0.30)	0.98	9202.8	12410.00
5	9008.99	86.22	1.147	0.30 ( 0.29)	0.98	9925.0	12400.00
6	9222.81	90.84	1.118	0.30 ( 0.29)	0.98	10622.3	12211.00
7	9349.15	94.81	1.100	0.30 ( 0.29)	0.98	11208.8	12201.00
8	9386.85	98.70	1.083	0.30 ( 0.29)	0.98	11677.1	12111.00
9	9369.11	101.16	1.071	0.30 ( 0.29)	0.98	11978.2	12231.00
10	9321.96	103.97	1.059	0.30 ( 0.29)	0.98	12282.5	12101.10
11	9302.16	104.81	1.055	0.30 ( 0.29)	0.98	12363.6	12261.00
12	8944.23	115.65	1.006	0.30 ( 0.29)	0.98	13112.3	12010.00
13	8608.51	123.88	0.976	0.30 ( 0.29)	0.98	13237.1	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12527.00 = 77156.98 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22062.51	36.57	1.735	0.30 ( 0.30)	1.00	7927.3	11831.00
2	22730.92	39.13	1.669	0.30 ( 0.30)	1.00	8506.1	11801.00
3	25131.30	47.53	1.477	0.30 ( 0.30)	1.00	10693.6	11500.00
4	25496.47	49.16	1.440	0.30 ( 0.30)	1.00	11330.4	11530.00
5	26351.67	53.71	1.385	0.30 ( 0.30)	1.00	13011.4	11701.00
6	26770.60	55.76	1.365	0.30 ( 0.30)	1.00	13820.7	11000.00
7	29288.13	65.54	1.286	0.30 ( 0.30)	1.00	18870.7	11330.00
8	30112.07	72.04	1.242	0.30 ( 0.30)	1.00	22320.1	11130.00
9	29640.54	80.38	1.186	0.30 ( 0.30)	1.00	25367.6	11620.00
10	29496.02	82.64	1.171	0.30 ( 0.30)	1.00	26140.5	11600.00
11	29045.91	88.61	1.131	0.30 ( 0.30)	1.00	27897.6	11111.00
12	28905.53	90.07	1.122	0.30 ( 0.30)	1.00	28279.7	11101.00
13	28567.30	94.87	1.100	0.30 ( 0.30)	1.00	29290.2	10710.00
14	28357.57	96.69	1.092	0.30 ( 0.30)	1.00	29594.4	10410.00
15	27932.08	101.05	1.072	0.30 ( 0.30)	1.00	30248.7	10700.00
16	27382.97	107.91	1.041	0.30 ( 0.30)	1.00	31215.2	10400.00
17	27136.30	109.87	1.032	0.30 ( 0.30)	1.00	31440.3	10200.00
18	26251.71	115.74	1.005	0.30 ( 0.30)	1.00	32001.9	10300.00
19	25290.20	121.31	0.983	0.30 ( 0.30)	1.00	32223.4	10210.00
20	23044.66	146.70	0.916	0.30 ( 0.30)	1.00	32916.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	28202.79	36.57	1.735	0.30 ( 0.30)	0.99	11535.3	11831.00
2	29001.54	39.13	1.669	0.30 ( 0.30)	0.99	12366.1	11801.00
3	31680.78	47.53	1.477	0.30 ( 0.30)	0.99	15382.7	11500.00
4	32059.21	49.16	1.440	0.30 ( 0.30)	0.99	16180.3	11530.00
5	33175.07	53.71	1.385	0.30 ( 0.30)	0.99	18309.8	11701.00
6	33723.77	55.76	1.365	0.30 ( 0.30)	0.99	19321.5	11000.00
7	36737.89	65.16	1.288	0.30 ( 0.30)	0.99	25104.5	12500.00
8	36861.41	65.54	1.286	0.30 ( 0.30)	0.99	25355.6	11330.00
9	38146.04	72.04	1.242	0.30 ( 0.30)	0.99	29785.9	11130.00
10	38236.23	78.31	1.200	0.30 ( 0.30)	0.99	33025.2	12300.00
11	38278.66	79.61	1.192	0.30 ( 0.30)	0.99	33776.2	12330.00
12	38288.66	80.38	1.186	0.30 ( 0.30)	0.99	34210.7	11620.00

13	38298.84	82.21	1.174	0.30 ( 0.30)	0.99	35193.2	12410.00
14	38296.41	82.64	1.171	0.30 ( 0.30)	0.99	35422.3	11600.00
15	38235.07	86.22	1.147	0.30 ( 0.30)	0.99	37119.2	12400.00
16	38165.37	88.61	1.131	0.30 ( 0.30)	0.99	38182.9	11111.00
17	38092.75	90.07	1.122	0.30 ( 0.30)	0.99	38786.0	11101.00
18	38074.14	90.84	1.118	0.30 ( 0.30)	0.99	39063.9	12211.00
19	37920.62	94.81	1.100	0.30 ( 0.30)	0.99	40486.6	12201.00
20	37917.02	94.87	1.100	0.30 ( 0.30)	0.99	40506.2	10710.00
21	37724.96	96.69	1.092	0.30 ( 0.30)	0.99	41029.8	10410.00
22	37548.43	98.70	1.083	0.30 ( 0.30)	0.99	41572.9	12111.00
23	37301.99	101.05	1.072	0.30 ( 0.30)	0.99	42213.2	10700.00
24	37292.19	101.16	1.071	0.30 ( 0.30)	0.99	42242.7	12231.00
25	37020.55	103.97	1.059	0.30 ( 0.30)	0.99	42942.2	12101.10
26	36933.59	104.81	1.055	0.30 ( 0.30)	0.99	43141.4	12261.00
27	36582.72	107.91	1.041	0.30 ( 0.30)	0.99	43793.0	10400.00
28	36271.25	109.87	1.032	0.30 ( 0.30)	0.99	44153.7	10200.00
29	35210.36	115.65	1.006	0.30 ( 0.30)	0.99	45105.1	12010.00
30	35192.02	115.74	1.005	0.30 ( 0.30)	0.99	45115.7	10300.00
31	34003.39	121.31	0.983	0.30 ( 0.30)	0.99	45421.6	10210.00
32	33671.84	123.88	0.976	0.30 ( 0.30)	0.99	45530.6	12000.00
33	30899.38	146.70	0.916	0.30 ( 0.30)	0.99	46153.7	10100.00

TOTAL AREA (ACRES) = 46153.7

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 38298.84 Tc (MIN.) = 82.205  
 EFFECTIVE AREA (ACRES) = 35193.20 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 46153.7  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

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FLOW PROCESS FROM NODE 12527.00 TO NODE 11929.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM (FEET) = 347.47 DOWNSTREAM (FEET) = 341.63  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 532.38 CHANNEL SLOPE = 0.0110  
 GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 9.79  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.170

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	14.37	0.30	0.987	-
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.987					
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 38304.50					
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 15.72					
AVERAGE FLOW DEPTH (FEET) = 9.79 TRAVEL TIME (MIN.) = 0.56					
Tc (MIN.) = 82.77					
SUBAREA AREA (ACRES) = 14.37 SUBAREA RUNOFF (CFS) = 11.31					
EFFECTIVE AREA (ACRES) = 35207.57 AREA-AVERAGED Fm (INCH/HR) = 0.30					
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99					
TOTAL AREA (ACRES) = 46168.0 PEAK FLOW RATE (CFS) = 38298.84					
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE					
GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0					



"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 9.78  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 9.78 FLOW VELOCITY(FEET/SEC.) = 15.73  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	28202.79	37.20	1.719	0.30( 0.30)	0.99	11549.6	11831.00
2	29001.54	39.75	1.653	0.30( 0.30)	0.99	12380.5	11801.00
3	31680.78	48.13	1.463	0.30( 0.30)	0.99	15397.0	11500.00
4	32059.21	49.76	1.426	0.30( 0.30)	0.99	16194.7	11530.00
5	33175.07	54.30	1.379	0.30( 0.30)	0.99	18324.2	11701.00
6	33723.77	56.35	1.359	0.30( 0.30)	0.99	19335.8	11000.00
7	36737.89	65.74	1.285	0.30( 0.30)	0.99	25118.9	12500.00
8	36861.41	66.11	1.282	0.30( 0.30)	0.99	25369.9	11330.00
9	38146.04	72.60	1.239	0.30( 0.30)	0.99	29800.3	11130.00
10	38236.23	78.88	1.197	0.30( 0.30)	0.99	33039.6	12300.00
11	38278.66	80.17	1.188	0.30( 0.30)	0.99	33790.5	12330.00
12	38288.66	80.95	1.183	0.30( 0.30)	0.99	34225.1	11620.00
13	38298.84	82.77	1.170	0.30( 0.30)	0.99	35207.6	12410.00
14	38296.41	83.21	1.168	0.30( 0.30)	0.99	35436.6	11600.00
15	38235.07	86.78	1.144	0.30( 0.30)	0.99	37133.6	12400.00
16	38165.37	89.17	1.128	0.30( 0.30)	0.99	38197.3	11111.00
17	38092.75	90.64	1.119	0.30( 0.30)	0.99	38800.3	11101.00
18	38074.14	91.40	1.116	0.30( 0.30)	0.99	39078.3	12211.00
19	37920.62	95.38	1.098	0.30( 0.30)	0.99	40501.0	12201.00
20	37917.02	95.43	1.097	0.30( 0.30)	0.99	40520.6	10710.00
21	37724.96	97.26	1.089	0.30( 0.30)	0.99	41044.2	10410.00
22	37548.43	99.27	1.080	0.30( 0.30)	0.99	41587.2	12111.00
23	37301.99	101.62	1.069	0.30( 0.30)	0.99	42227.6	10700.00
24	37292.19	101.73	1.069	0.30( 0.30)	0.99	42257.1	12231.00
25	37020.55	104.54	1.056	0.30( 0.30)	0.99	42956.6	12101.10
26	36933.59	105.38	1.052	0.30( 0.30)	0.99	43155.8	12261.00
27	36582.72	108.48	1.038	0.30( 0.30)	0.99	43807.3	10400.00
28	36271.25	110.44	1.029	0.30( 0.30)	0.99	44168.0	10200.00
29	35210.36	116.23	1.003	0.30( 0.30)	0.99	45119.4	12010.00
30	35192.02	116.32	1.003	0.30( 0.30)	0.99	45130.1	10300.00
31	34003.39	121.90	0.981	0.30( 0.30)	0.99	45436.0	10210.00
32	33671.84	124.46	0.974	0.30( 0.30)	0.99	45544.9	12000.00
33	30899.38	147.31	0.915	0.30( 0.30)	0.99	46168.0	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 38298.84 Tc(MIN.) = 82.77  
 AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 35207.57

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FLOW PROCESS FROM NODE 11928.00 TO NODE 11929.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	28202.79	37.20	1.719	0.30( 0.30)	0.99	11549.6	11831.00

2	29001.54	39.75	1.653	0.30( 0.30)	0.99	12380.5	11801.00
3	31680.78	48.13	1.463	0.30( 0.30)	0.99	15397.0	11500.00
4	32059.21	49.76	1.426	0.30( 0.30)	0.99	16194.7	11530.00
5	33175.07	54.30	1.379	0.30( 0.30)	0.99	18324.2	11701.00
6	33723.77	56.35	1.359	0.30( 0.30)	0.99	19335.8	11000.00
7	36737.89	65.74	1.285	0.30( 0.30)	0.99	25118.9	12500.00
8	36861.41	66.11	1.282	0.30( 0.30)	0.99	25369.9	11330.00
9	38146.04	72.60	1.239	0.30( 0.30)	0.99	29800.3	11130.00
10	38236.23	78.88	1.197	0.30( 0.30)	0.99	33039.6	12300.00
11	38278.66	80.17	1.188	0.30( 0.30)	0.99	33790.5	12330.00
12	38288.66	80.95	1.183	0.30( 0.30)	0.99	34225.1	11620.00
13	38298.84	82.77	1.170	0.30( 0.30)	0.99	35207.6	12410.00
14	38296.41	83.21	1.168	0.30( 0.30)	0.99	35436.6	11600.00
15	38235.07	86.78	1.144	0.30( 0.30)	0.99	37133.6	12400.00
16	38165.37	89.17	1.128	0.30( 0.30)	0.99	38197.3	11111.00
17	38092.75	90.64	1.119	0.30( 0.30)	0.99	38800.3	11101.00
18	38074.14	91.40	1.116	0.30( 0.30)	0.99	39078.3	12211.00
19	37920.62	95.38	1.098	0.30( 0.30)	0.99	40501.0	12201.00
20	37917.02	95.43	1.097	0.30( 0.30)	0.99	40520.6	10710.00
21	37724.96	97.26	1.089	0.30( 0.30)	0.99	41044.2	10410.00
22	37548.43	99.27	1.080	0.30( 0.30)	0.99	41587.2	12111.00
23	37301.99	101.62	1.069	0.30( 0.30)	0.99	42227.6	10700.00
24	37292.19	101.73	1.069	0.30( 0.30)	0.99	42257.1	12231.00
25	37020.55	104.54	1.056	0.30( 0.30)	0.99	42956.6	12101.10
26	36933.59	105.38	1.052	0.30( 0.30)	0.99	43155.8	12261.00
27	36582.72	108.48	1.038	0.30( 0.30)	0.99	43807.3	10400.00
28	36271.25	110.44	1.029	0.30( 0.30)	0.99	44168.0	10200.00
29	35210.36	116.23	1.003	0.30( 0.30)	0.99	45119.4	12010.00
30	35192.02	116.32	1.003	0.30( 0.30)	0.99	45130.1	10300.00
31	34003.39	121.90	0.981	0.30( 0.30)	0.99	45436.0	10210.00
32	33671.84	124.46	0.974	0.30( 0.30)	0.99	45544.9	12000.00
33	30899.38	147.31	0.915	0.30( 0.30)	0.99	46168.0	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2817.53	16.62	2.837	0.30( 0.30)	1.00	1042.9	40200.00
2	3188.68	28.73	1.961	0.30( 0.30)	1.00	1886.8	40120.00
3	3208.47	30.53	1.889	0.30( 0.30)	1.00	2004.8	40100.00
4	3278.35	58.23	1.340	0.30( 0.30)	1.00	3335.7	11900.00
5	3262.97	58.67	1.336	0.30( 0.30)	1.00	3343.7	11910.00

LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11929.00 = 30683.27 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25330.83	16.62	2.837	0.30( 0.30)	0.99	6202.0	40200.00
2	28687.77	28.73	1.961	0.30( 0.30)	0.99	10807.9	40120.00
3	29136.17	30.53	1.889	0.30( 0.30)	0.99	11484.0	40100.00
4	31428.09	37.20	1.719	0.30( 0.30)	0.99	13874.9	11831.00
5	32233.26	39.75	1.653	0.30( 0.30)	0.99	14828.3	11801.00
6	34933.67	48.13	1.463	0.30( 0.30)	0.99	18247.8	11500.00
7	35316.21	49.76	1.426	0.30( 0.30)	0.99	19123.7	11530.00
8	36443.52	54.30	1.379	0.30( 0.30)	0.99	21471.3	11701.00
9	36997.39	56.35	1.359	0.30( 0.30)	0.99	22581.4	11000.00
10	37604.40	58.23	1.340	0.30( 0.30)	0.99	23827.1	11900.00
11	37730.98	58.67	1.336	0.30( 0.30)	0.99	24107.5	11910.00

12	39838.87	65.74	1.285	0.30	(	0.30)	0.99	28462.6	12500.00
13	39954.48	66.11	1.282	0.30	(	0.30)	0.99	28713.7	11330.00
14	41102.23	72.60	1.239	0.30	(	0.30)	0.99	33144.0	11130.00
15	41060.13	78.88	1.197	0.30	(	0.30)	0.99	36383.3	12300.00
16	41075.25	80.17	1.188	0.30	(	0.30)	0.99	37134.3	12330.00
17	41068.96	80.95	1.183	0.30	(	0.30)	0.99	37568.8	11620.00
18	41040.71	82.77	1.170	0.30	(	0.30)	0.99	38551.3	12410.00
19	41029.02	83.21	1.168	0.30	(	0.30)	0.99	38780.4	11600.00
20	40892.30	86.78	1.144	0.30	(	0.30)	0.99	40477.3	12400.00
21	40772.28	89.17	1.128	0.30	(	0.30)	0.99	41541.0	11111.00
22	40673.12	90.64	1.119	0.30	(	0.30)	0.99	42144.1	11101.00
23	40643.55	91.40	1.116	0.30	(	0.30)	0.99	42422.0	12211.00
24	40433.39	95.38	1.098	0.30	(	0.30)	0.99	43844.7	12201.00
25	40428.94	95.43	1.097	0.30	(	0.30)	0.99	43864.3	10710.00
26	40210.86	97.26	1.089	0.30	(	0.30)	0.99	44387.9	10410.00
27	40005.67	99.27	1.080	0.30	(	0.30)	0.99	44930.9	12111.00
28	39725.68	101.62	1.069	0.30	(	0.30)	0.99	45571.3	10700.00
29	39714.27	101.73	1.069	0.30	(	0.30)	0.99	45600.8	12231.00
30	39402.63	104.54	1.056	0.30	(	0.30)	0.99	46300.3	12101.10
31	39303.71	105.38	1.052	0.30	(	0.30)	0.99	46499.5	12261.00
32	38908.56	108.48	1.038	0.30	(	0.30)	0.99	47151.1	10400.00
33	38569.07	110.44	1.029	0.30	(	0.30)	0.99	47511.8	10200.00
34	37425.68	116.23	1.003	0.30	(	0.30)	0.99	48463.2	12010.00
35	37405.98	116.32	1.003	0.30	(	0.30)	0.99	48473.8	10300.00
36	36149.29	121.90	0.981	0.30	(	0.30)	0.99	48779.7	10210.00
37	35796.61	124.46	0.974	0.30	(	0.30)	0.99	48888.7	12000.00
38	32836.05	147.31	0.915	0.30	(	0.30)	0.99	49511.8	10100.00

TOTAL AREA (ACRES) = 49511.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 41102.23 Tc (MIN.) = 72.603  
EFFECTIVE AREA (ACRES) = 33144.04 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 49511.8  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

=====  
END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 49511.8 TC (MIN.) = 72.60  
EFFECTIVE AREA (ACRES) = 33144.04 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.994  
PEAK FLOW RATE (CFS) = 41102.23

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25330.83	16.62	2.837	0.30 (0.30)	0.99	6202.0	40200.00
2	28687.77	28.73	1.961	0.30 (0.30)	0.99	10807.9	40120.00
3	29136.17	30.53	1.889	0.30 (0.30)	0.99	11484.0	40100.00
4	31428.09	37.20	1.719	0.30 (0.30)	0.99	13874.9	11831.00
5	32233.26	39.75	1.653	0.30 (0.30)	0.99	14828.3	11801.00
6	34933.67	48.13	1.463	0.30 (0.30)	0.99	18247.8	11500.00
7	35316.21	49.76	1.426	0.30 (0.30)	0.99	19123.7	11530.00
8	36443.52	54.30	1.379	0.30 (0.30)	0.99	21471.3	11701.00
9	36997.39	56.35	1.359	0.30 (0.30)	0.99	22581.4	11000.00
10	37604.40	58.23	1.340	0.30 (0.30)	0.99	23827.1	11900.00
11	37730.98	58.67	1.336	0.30 (0.30)	0.99	24107.5	11910.00
12	39838.87	65.74	1.285	0.30 (0.30)	0.99	28462.6	12500.00
13	39954.48	66.11	1.282	0.30 (0.30)	0.99	28713.7	11330.00

14	41102.23	72.60	1.239	0.30	(	0.30)	0.99	33144.0	11130.00
15	41060.13	78.88	1.197	0.30	(	0.30)	0.99	36383.3	12300.00
16	41075.25	80.17	1.188	0.30	(	0.30)	0.99	37134.3	12330.00
17	41068.96	80.95	1.183	0.30	(	0.30)	0.99	37568.8	11620.00
18	41040.71	82.77	1.170	0.30	(	0.30)	0.99	38551.3	12410.00
19	41029.02	83.21	1.168	0.30	(	0.30)	0.99	38780.4	11600.00
20	40892.30	86.78	1.144	0.30	(	0.30)	0.99	40477.3	12400.00
21	40772.28	89.17	1.128	0.30	(	0.30)	0.99	41541.0	11111.00
22	40673.12	90.64	1.119	0.30	(	0.30)	0.99	42144.1	11101.00
23	40643.55	91.40	1.116	0.30	(	0.30)	0.99	42422.0	12211.00
24	40433.39	95.38	1.098	0.30	(	0.30)	0.99	43844.7	12201.00
25	40428.94	95.43	1.097	0.30	(	0.30)	0.99	43864.3	10710.00
26	40210.86	97.26	1.089	0.30	(	0.30)	0.99	44387.9	10410.00
27	40005.67	99.27	1.080	0.30	(	0.30)	0.99	44930.9	12111.00
28	39725.68	101.62	1.069	0.30	(	0.30)	0.99	45571.3	10700.00
29	39714.27	101.73	1.069	0.30	(	0.30)	0.99	45600.8	12231.00
30	39402.63	104.54	1.056	0.30	(	0.30)	0.99	46300.3	12101.10
31	39303.71	105.38	1.052	0.30	(	0.30)	0.99	46499.5	12261.00
32	38908.56	108.48	1.038	0.30	(	0.30)	0.99	47151.1	10400.00
33	38569.07	110.44	1.029	0.30	(	0.30)	0.99	47511.8	10200.00
34	37425.68	116.23	1.003	0.30	(	0.30)	0.99	48463.2	12010.00
35	37405.98	116.32	1.003	0.30	(	0.30)	0.99	48473.8	10300.00
36	36149.29	121.90	0.981	0.30	(	0.30)	0.99	48779.7	10210.00
37	35796.61	124.46	0.974	0.30	(	0.30)	0.99	48888.7	12000.00
38	32836.05	147.31	0.915	0.30	(	0.30)	0.99	49511.8	10100.00

=====  
END OF RATIONAL METHOD ANALYSIS  
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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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Analysis prepared by:

Michael Baker International
5 Hutton Centre Drive, Suite 500
Santa Ana, CA
92707

FILE NAME: S20.DAT
TIME/DATE OF STUDY: 08:10 07/16/2018

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.549
2) 10.00; 3.628
3) 15.00; 2.829
4) 20.00; 2.353
5) 25.00; 2.048
6) 30.00; 1.832
7) 40.00; 1.577
8) 50.00; 1.373
9) 60.00; 1.248
10) 90.00; 1.043
11) 120.00; 0.905
12) 180.00; 0.750
13) 360.00; 0.547
14) 1440.00; 0.235

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

Table with columns: NO., WIDTH (FT), CROSSFALL (FT), IN- / SIDE, OUT- / SIDE, PARK- / WAY, CURB HEIGHT (FT), GUTTER WIDTH (FT), GEOMETRIES LIP (FT), HIKE (FT), MANNING FACTOR (n)

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 12000.00 TO NODE 12001.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 965.01
ELEVATION DATA: UPSTREAM(FEET) = 4506.20 DOWNSTREAM(FEET) = 4179.61

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.700
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.037

SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" - 9.03 0.30 1.000 0 13.70
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 22.24
TOTAL AREA (ACRES) = 9.03 PEAK FLOW RATE (CFS) = 22.24

\*\*\*\*\*

FLOW PROCESS FROM NODE 12001.00 TO NODE 12002.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 4179.61 DOWNSTREAM(FEET) = 3849.51
CHANNEL LENGTH THRU SUBAREA(FEET) = 976.60 CHANNEL SLOPE = 0.3380
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.49
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.765

SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN
USER-DEFINED - 18.82 0.30 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 43.14
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.24
AVERAGE FLOW DEPTH(FEET) = 0.48 TRAVEL TIME(MIN.) = 1.97
Tc(MIN.) = 15.67

SUBAREA AREA(ACRES) = 18.82 SUBAREA RUNOFF(CFS) = 41.75
EFFECTIVE AREA(ACRES) = 27.85 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 27.8 PEAK FLOW RATE(CFS) = 61.78
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.59

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.59 FLOW VELOCITY(FEET/SEC.) = 9.36
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12002.00 = 1941.61 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12002.00 TO NODE 12003.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3849.51 DOWNSTREAM(FEET) = 3265.69  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1892.03 CHANNEL SLOPE = 0.3086  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.97  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.509  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	68.96	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 130.45  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.75  
AVERAGE FLOW DEPTH(FEET) = 0.94 TRAVEL TIME(MIN.) = 2.68  
Tc(MIN.) = 18.36  
SUBAREA AREA(ACRES) = 68.96 SUBAREA RUNOFF(CFS) = 137.11  
EFFECTIVE AREA(ACRES) = 96.81 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 96.8 PEAK FLOW RATE(CFS) = 192.49  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.17

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.17 FLOW VELOCITY(FEET/SEC.) = 13.30  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12003.00 = 3833.64 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12003.00 TO NODE 12020.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3265.69 DOWNSTREAM(FEET) = 2427.28  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3118.62 CHANNEL SLOPE = 0.2688  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.12  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.265  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	328.28	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 483.34  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.83  
AVERAGE FLOW DEPTH(FEET) = 2.04 TRAVEL TIME(MIN.) = 3.09  
Tc(MIN.) = 21.45  
SUBAREA AREA(ACRES) = 328.28 SUBAREA RUNOFF(CFS) = 580.48  
EFFECTIVE AREA(ACRES) = 425.09 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 425.1 PEAK FLOW RATE(CFS) = 751.67

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.59

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.59 FLOW VELOCITY(FEET/SEC.) = 19.13  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12020.00 = 6952.26 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12003.00 TO NODE 12020.00 IS CODE = 1

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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 21.45  
RAINFALL INTENSITY(INCH/HR) = 2.26  
AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 425.09  
TOTAL STREAM AREA(ACRES) = 425.09  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 751.67

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12010.00 TO NODE 12011.00 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 264.80  
ELEVATION DATA: UPSTREAM(FEET) = 4208.12 DOWNSTREAM(FEET) = 4068.13

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.470  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.600  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	-	2.06	0.30	1.000	0	7.47

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 7.97  
TOTAL AREA(ACRES) = 2.06 PEAK FLOW RATE(CFS) = 7.97

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12011.00 TO NODE 12012.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 4068.13 DOWNSTREAM(FEET) = 3694.92  
CHANNEL LENGTH THRU SUBAREA(FEET) = 654.45 CHANNEL SLOPE = 0.5703  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.22  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.950

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	3.98	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14.55  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.44  
AVERAGE FLOW DEPTH(FEET) = 0.22 TRAVEL TIME(MIN.) = 1.69  
Tc(MIN.) = 9.16  
SUBAREA AREA(ACRES) = 3.98 SUBAREA RUNOFF(CFS) = 13.07  
EFFECTIVE AREA(ACRES) = 6.04 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 6.0 PEAK FLOW RATE(CFS) = 19.84  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.26

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.26 FLOW VELOCITY(FEET/SEC.) = 7.36  
LONGEST FLOWPATH FROM NODE 12010.00 TO NODE 12012.00 = 919.25 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12012.00 TO NODE 12013.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3694.92 DOWNSTREAM(FEET) = 3415.55  
CHANNEL LENGTH THRU SUBAREA(FEET) = 981.94 CHANNEL SLOPE = 0.2845  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.71  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.479  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	35.56	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 70.87  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.26  
AVERAGE FLOW DEPTH(FEET) = 0.67 TRAVEL TIME(MIN.) = 1.77  
Tc(MIN.) = 10.93  
SUBAREA AREA(ACRES) = 35.56 SUBAREA RUNOFF(CFS) = 101.75  
EFFECTIVE AREA(ACRES) = 41.60 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 41.6 PEAK FLOW RATE(CFS) = 119.04  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.91

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.91 FLOW VELOCITY(FEET/SEC.) = 11.06  
LONGEST FLOWPATH FROM NODE 12010.00 TO NODE 12013.00 = 1901.19 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12013.00 TO NODE 12014.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3415.55 DOWNSTREAM(FEET) = 2756.62  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1926.68 CHANNEL SLOPE = 0.3420  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.24  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.117  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	72.40	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 211.02  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.17  
AVERAGE FLOW DEPTH(FEET) = 1.20 TRAVEL TIME(MIN.) = 2.27  
Tc(MIN.) = 13.20  
SUBAREA AREA(ACRES) = 72.40 SUBAREA RUNOFF(CFS) = 183.58  
EFFECTIVE AREA(ACRES) = 114.00 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 114.0 PEAK FLOW RATE(CFS) = 289.06  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.43

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.43 FLOW VELOCITY(FEET/SEC.) = 15.70  
LONGEST FLOWPATH FROM NODE 12010.00 TO NODE 12014.00 = 3827.87 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12014.00 TO NODE 12020.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2756.62 DOWNSTREAM(FEET) = 2427.28  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1697.28 CHANNEL SLOPE = 0.1940  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.13  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.814  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	121.96	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 427.19  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.45  
AVERAGE FLOW DEPTH(FEET) = 2.09 TRAVEL TIME(MIN.) = 1.96  
Tc(MIN.) = 15.15  
SUBAREA AREA(ACRES) = 121.96 SUBAREA RUNOFF(CFS) = 276.00  
EFFECTIVE AREA(ACRES) = 235.96 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 236.0 PEAK FLOW RATE(CFS) = 533.98

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.35

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 2.35 FLOW VELOCITY (FEET/SEC.) = 15.43  
LONGEST FLOWPATH FROM NODE 12010.00 TO NODE 12020.00 = 5525.15 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12014.00 TO NODE 12020.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION (MIN.) = 15.15  
RAINFALL INTENSITY (INCH/HR) = 2.81  
AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA (ACRES) = 235.96  
TOTAL STREAM AREA (ACRES) = 235.96  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 533.98

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	751.67	21.45	2.265	0.30 (0.30)	1.00	425.1	12000.00
2	533.98	15.15	2.814	0.30 (0.30)	1.00	236.0	12010.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1213.64	15.15	2.814	0.30 (0.30)	1.00	536.3	12010.00
2	1168.91	21.45	2.265	0.30 (0.30)	1.00	661.0	12000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
PEAK FLOW RATE (CFS) = 1213.64 Tc (MIN.) = 15.15  
EFFECTIVE AREA (ACRES) = 536.29 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 661.0  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12020.00 = 6952.26 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12020.00 TO NODE 12021.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2427.28 DOWNSTREAM (FEET) = 2056.25  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2698.04 CHANNEL SLOPE = 0.1375  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 4.59

\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.583

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 376.13 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1600.32  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 18.49  
AVERAGE FLOW DEPTH (FEET) = 4.54 TRAVEL TIME (MIN.) = 2.43  
Tc (MIN.) = 17.58  
SUBAREA AREA (ACRES) = 376.13 SUBAREA RUNOFF (CFS) = 772.84  
EFFECTIVE AREA (ACRES) = 912.42 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 1037.2 PEAK FLOW RATE (CFS) = 1874.76  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 4.91

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 4.91 FLOW VELOCITY (FEET/SEC.) = 19.27  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12021.00 = 9650.30 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12021.00 TO NODE 12022.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2056.25 DOWNSTREAM (FEET) = 1864.68  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2552.86 CHANNEL SLOPE = 0.0750  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 6.18  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.339

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 347.45 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2193.65  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 16.08  
AVERAGE FLOW DEPTH (FEET) = 6.13 TRAVEL TIME (MIN.) = 2.65  
Tc (MIN.) = 20.23  
SUBAREA AREA (ACRES) = 347.45 SUBAREA RUNOFF (CFS) = 637.60  
EFFECTIVE AREA (ACRES) = 1259.87 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 1384.6 PEAK FLOW RATE (CFS) = 2311.97  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 6.28

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 6.28 FLOW VELOCITY (FEET/SEC.) = 16.30  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12022.00 = 12203.16 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12022.00 TO NODE 12023.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1864.68 DOWNSTREAM(FEET) = 1710.75
CHANNEL LENGTH THRU SUBAREA(FEET) = 1886.57 CHANNEL SLOPE = 0.0816
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.48
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.228

SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 280.70 0.30 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2555.50
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 17.26
AVERAGE FLOW DEPTH(FEET) = 6.46 TRAVEL TIME(MIN.) = 1.82
Tc(MIN.) = 22.05

SUBAREA AREA(ACRES) = 280.70 SUBAREA RUNOFF(CFS) = 487.04
EFFECTIVE AREA(ACRES) = 1540.57 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 1665.3 PEAK FLOW RATE(CFS) = 2673.03
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.60

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 6.60 FLOW VELOCITY(FEET/SEC.) = 17.45
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12023.00 = 14089.73 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 12023.00 TO NODE 12024.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1710.75 DOWNSTREAM(FEET) = 1672.60
CHANNEL LENGTH THRU SUBAREA(FEET) = 1944.87 CHANNEL SLOPE = 0.0196
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 9.50
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.041

SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 248.35 0.30 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2867.69
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.46
AVERAGE FLOW DEPTH(FEET) = 9.47 TRAVEL TIME(MIN.) = 3.10
Tc(MIN.) = 25.15

SUBAREA AREA(ACRES) = 248.35 SUBAREA RUNOFF(CFS) = 389.26
EFFECTIVE AREA(ACRES) = 1788.92 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1913.7 PEAK FLOW RATE(CFS) = 2803.90
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 9.37

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 9.37 FLOW VELOCITY(FEET/SEC.) = 10.41
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12024.00 = 16034.60 FEET.

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 1913.7 TC(MIN.) = 25.15
EFFECTIVE AREA(ACRES) = 1788.92 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.000
PEAK FLOW RATE(CFS) = 2803.90

\*\* PEAK FLOW RATE TABLE \*\*
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 2803.90 25.15 2.041 0.30( 0.30) 1.00 1788.9 12010.00
2 2562.91 31.73 1.788 0.30( 0.30) 1.00 1913.7 12000.00

END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*

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

Michael Baker International
5 Hutton Centre Drive, Suite 500
Santa Ana, CA
92707

FILE NAME: S21.DAT
TIME/DATE OF STUDY: 08:10 07/16/2018

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.549
2) 10.00; 3.628
3) 15.00; 2.829
4) 20.00; 2.353
5) 25.00; 2.048
6) 30.00; 1.832
7) 40.00; 1.577
8) 50.00; 1.373
9) 60.00; 1.248
10) 90.00; 1.043
11) 120.00; 0.905
12) 180.00; 0.750
13) 360.00; 0.547
14) 1440.00; 0.235

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

Table with columns: NO., WIDTH (FT), CROSSFALL (FT), IN- / OUT- / PARK- SIDE / SIDE / WAY, HEIGHT (FT), CURB GUTTER-GEOMETRIES: MANNING WIDTH (FT), LIP (FT), HIKE (FT), FACTOR (n). Row 1: 1, 30.0, 20.0, 0.018/0.018/0.020, 0.67, 2.00, 0.0313, 0.167, 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 12023.00 TO NODE 12024.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S20.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

Table with columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Fp (Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows for stream 1, 2, and total area.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12023.00 TO NODE 12024.00 IS CODE = 14.0

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

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

Table with columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Fp (Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows for stream 1, 2, and total area.

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FLOW PROCESS FROM NODE 12024.00 TO NODE 12102.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1672.60 DOWNSTREAM(FEET) = 1636.82
CHANNEL LENGTH THRU SUBAREA(FEET) = 780.49 CHANNEL SLOPE = 0.0458
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.82
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.002

SUBAREA LOSS RATE DATA(AMC II):

Table with columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Row: USER-DEFINED, -, 93.19, 0.30, 1.000, -

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2875.29

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.35

AVERAGE FLOW DEPTH(FEET) = 7.82 TRAVEL TIME(MIN.) = 0.91

Tc(MIN.) = 26.06

SUBAREA AREA(ACRES) = 93.19 SUBAREA RUNOFF(CFS) = 142.78

EFFECTIVE AREA(ACRES) = 1882.11 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 2006.9 PEAK FLOW RATE(CFS) = 2883.64

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.82

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 7.82 FLOW VELOCITY(FEET/SEC.) = 14.37



LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12102.00 = 16815.09 FEET.

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FLOW PROCESS FROM NODE 12024.00 TO NODE 12102.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION (MIN.) = 26.06  
RAINFALL INTENSITY (INCH/HR) = 2.00  
AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA (ACRES) = 1882.11  
TOTAL STREAM AREA (ACRES) = 2006.87  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 2883.64

\*\*\*\*\*

FLOW PROCESS FROM NODE 12101.10 TO NODE 12101.20 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH (FEET) = 847.57  
ELEVATION DATA: UPSTREAM (FEET) = 3435.00 DOWNSTREAM (FEET) = 2774.23

Tc = K \* [(LENGTH\*\* 3.00) / (ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 11.008  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.467  
SUBAREA Tc AND LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL, NARROWLEAF" - 6.56 0.30 1.000 0 11.01  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF (CFS) = 18.70  
TOTAL AREA (ACRES) = 6.56 PEAK FLOW RATE (CFS) = 18.70

\*\*\*\*\*

FLOW PROCESS FROM NODE 12101.20 TO NODE 12101.30 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM (FEET) = 2774.23 DOWNSTREAM (FEET) = 2097.09  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1205.19 CHANNEL SLOPE = 0.5619  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.54  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.178  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 34.88 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 64.01  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.11  
AVERAGE FLOW DEPTH (FEET) = 0.52 TRAVEL TIME (MIN.) = 1.81  
Tc (MIN.) = 12.82  
SUBAREA AREA (ACRES) = 34.88 SUBAREA RUNOFF (CFS) = 90.35  
EFFECTIVE AREA (ACRES) = 41.44 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 41.4 PEAK FLOW RATE (CFS) = 107.34  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.70

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.70 FLOW VELOCITY (FEET/SEC.) = 13.35  
LONGEST FLOWPATH FROM NODE 12101.10 TO NODE 12101.30 = 2052.76 FEET.

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FLOW PROCESS FROM NODE 12101.30 TO NODE 12102.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM (FEET) = 2097.09 DOWNSTREAM (FEET) = 1636.82  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1553.74 CHANNEL SLOPE = 0.2962  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.14  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.852  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 56.40 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 172.23  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.68  
AVERAGE FLOW DEPTH (FEET) = 1.11 TRAVEL TIME (MIN.) = 2.04  
Tc (MIN.) = 14.86  
SUBAREA AREA (ACRES) = 56.40 SUBAREA RUNOFF (CFS) = 129.53  
EFFECTIVE AREA (ACRES) = 97.84 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 97.8 PEAK FLOW RATE (CFS) = 224.71  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.29

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.29 FLOW VELOCITY (FEET/SEC.) = 13.79  
LONGEST FLOWPATH FROM NODE 12101.10 TO NODE 12102.00 = 3606.50 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12101.30 TO NODE 12102.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 14.86  
 RAINFALL INTENSITY(INCH/HR) = 2.85  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 97.84  
 TOTAL STREAM AREA(ACRES) = 97.84  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 224.71

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2883.64	26.06	2.002	0.30( 0.30)	1.00	1882.1	12010.00
1	2645.01	32.65	1.764	0.30( 0.30)	1.00	2006.9	12000.00
2	224.71	14.86	2.852	0.30( 0.30)	1.00	97.8	12101.10

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2689.32	14.86	2.852	0.30( 0.30)	1.00	1171.0	12101.10
2	3033.55	26.06	2.002	0.30( 0.30)	1.00	1979.9	12010.00
3	2773.96	32.65	1.764	0.30( 0.30)	1.00	2104.7	12000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 3033.55 Tc(MIN.) = 26.06  
 EFFECTIVE AREA(ACRES) = 1979.95 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 2104.7  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12102.00 = 16815.09 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12102.00 TO NODE 12103.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 1636.82 DOWNSTREAM(FEET) = 1558.46  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2049.75 CHANNEL SLOPE = 0.0382  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 8.46  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.895  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 116.59 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3117.21  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.70  
 AVERAGE FLOW DEPTH(FEET) = 8.46 TRAVEL TIME(MIN.) = 2.49  
 Tc(MIN.) = 28.55  
 SUBAREA AREA(ACRES) = 116.59 SUBAREA RUNOFF(CFS) = 167.33  
 EFFECTIVE AREA(ACRES) = 2096.54 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 2221.3 PEAK FLOW RATE(CFS) = 3033.55  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 8.35

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.35 FLOW VELOCITY(FEET/SEC.) = 13.61  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12103.00 = 18864.84 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12103.00 TO NODE 12104.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1558.46 DOWNSTREAM(FEET) = 1453.87  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1971.34 CHANNEL SLOPE = 0.0531  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 8.04  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.815  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 355.30 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3275.87  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.68  
 AVERAGE FLOW DEPTH(FEET) = 8.02 TRAVEL TIME(MIN.) = 2.10  
 Tc(MIN.) = 30.65  
 SUBAREA AREA(ACRES) = 355.30 SUBAREA RUNOFF(CFS) = 484.63  
 EFFECTIVE AREA(ACRES) = 2451.84 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 2576.6 PEAK FLOW RATE(CFS) = 3344.29  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 8.10

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.10 FLOW VELOCITY(FEET/SEC.) = 15.76  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12104.00 = 20836.18 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12104.00 TO NODE 12105.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1453.87 DOWNSTREAM(FEET) = 1369.72  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1885.63 CHANNEL SLOPE = 0.0446  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 8.59  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.762  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 200.37 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3476.10  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.92  
 AVERAGE FLOW DEPTH(FEET) = 8.58 TRAVEL TIME(MIN.) = 2.11  
 Tc(MIN.) = 32.75  
 SUBAREA AREA(ACRES) = 200.37 SUBAREA RUNOFF(CFS) = 263.62  
 EFFECTIVE AREA(ACRES) = 2652.21 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 2777.0 PEAK FLOW RATE(CFS) = 3489.40  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 8.59

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 8.59 FLOW VELOCITY(FEET/SEC.) = 14.94  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12105.00 = 22721.81 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12105.00 TO NODE 12106.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 1369.72 DOWNSTREAM(FEET) = 1298.29  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1910.12 CHANNEL SLOPE = 0.0374  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 9.20  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.705  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 339.52 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3704.02  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.20  
 AVERAGE FLOW DEPTH(FEET) = 9.19 TRAVEL TIME(MIN.) = 2.24  
 Tc(MIN.) = 35.00  
 SUBAREA AREA(ACRES) = 339.52 SUBAREA RUNOFF(CFS) = 429.22  
 EFFECTIVE AREA(ACRES) = 2991.73 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 3116.5 PEAK FLOW RATE(CFS) = 3782.16  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 9.28

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 9.28 FLOW VELOCITY(FEET/SEC.) = 14.27  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12106.00 = 24631.93 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12106.00 TO NODE 12121.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 1298.29 DOWNSTREAM(FEET) = 1215.72  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2982.44 CHANNEL SLOPE = 0.0277  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 10.05  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.606  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 164.97 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3879.11  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.84  
 AVERAGE FLOW DEPTH(FEET) = 10.04 TRAVEL TIME(MIN.) = 3.87  
 Tc(MIN.) = 38.87  
 SUBAREA AREA(ACRES) = 164.97 SUBAREA RUNOFF(CFS) = 193.90  
 EFFECTIVE AREA(ACRES) = 3156.70 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 3281.5 PEAK FLOW RATE(CFS) = 3782.16  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 9.93

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 9.93 FLOW VELOCITY(FEET/SEC.) = 12.76  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12121.00 = 27614.37 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12106.00 TO NODE 12121.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 =====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 38.87  
 RAINFALL INTENSITY(INCH/HR) = 1.61  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 3156.70  
 TOTAL STREAM AREA(ACRES) = 3281.46  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 3782.16

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12111.00 TO NODE 12112.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
 =====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 939.51  
 ELEVATION DATA: UPSTREAM(FEET) = 3108.05 DOWNSTREAM(FEET) = 2753.95

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.265

\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.106  
 SUBAREA Tc AND LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
 NATURAL FAIR COVER  
 "CHAPARRAL, BROADLEAF" - 8.25 0.30 1.000 0 13.27  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF (CFS) = 20.84  
 TOTAL AREA (ACRES) = 8.25 PEAK FLOW RATE (CFS) = 20.84

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12112.00 TO NODE 12113.00 IS CODE = 56  
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>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>> TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2753.95 DOWNSTREAM (FEET) = 2458.45  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 945.14 CHANNEL SLOPE = 0.3127  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \* ESTIMATED CHANNEL HEIGHT (FEET) = 0.48

\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.802  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 16.51 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 39.45  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.81  
 AVERAGE FLOW DEPTH (FEET) = 0.46 TRAVEL TIME (MIN.) = 2.02  
 Tc (MIN.) = 15.28  
 SUBAREA AREA (ACRES) = 16.51 SUBAREA RUNOFF (CFS) = 37.18  
 EFFECTIVE AREA (ACRES) = 24.76 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 24.8 PEAK FLOW RATE (CFS) = 55.76  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \* ESTIMATED CHANNEL HEIGHT (FEET) = 0.57

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.57 FLOW VELOCITY (FEET/SEC.) = 8.79  
 LONGEST FLOWPATH FROM NODE 12111.00 TO NODE 12113.00 = 1884.65 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12113.00 TO NODE 12114.00 IS CODE = 56  
 -----

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>> TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2458.45 DOWNSTREAM (FEET) = 1823.37  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1903.76 CHANNEL SLOPE = 0.3336  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \* ESTIMATED CHANNEL HEIGHT (FEET) = 0.88  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.539  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 57.98 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 114.30  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.50  
 AVERAGE FLOW DEPTH (FEET) = 0.85 TRAVEL TIME (MIN.) = 2.76  
 Tc (MIN.) = 18.04  
 SUBAREA AREA (ACRES) = 57.98 SUBAREA RUNOFF (CFS) = 116.86  
 EFFECTIVE AREA (ACRES) = 82.74 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 82.7 PEAK FLOW RATE (CFS) = 166.76  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \* ESTIMATED CHANNEL HEIGHT (FEET) = 1.06

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.06 FLOW VELOCITY (FEET/SEC.) = 13.04  
 LONGEST FLOWPATH FROM NODE 12111.00 TO NODE 12114.00 = 3788.41 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12114.00 TO NODE 12115.00 IS CODE = 56  
 -----

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>> TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1823.37 DOWNSTREAM (FEET) = 1500.53  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1685.04 CHANNEL SLOPE = 0.1916  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \* ESTIMATED CHANNEL HEIGHT (FEET) = 1.70  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.338  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 124.07 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 280.60  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.71  
 AVERAGE FLOW DEPTH (FEET) = 1.66 TRAVEL TIME (MIN.) = 2.21  
 Tc (MIN.) = 20.25  
 SUBAREA AREA (ACRES) = 124.07 SUBAREA RUNOFF (CFS) = 227.53  
 EFFECTIVE AREA (ACRES) = 206.81 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 206.8 PEAK FLOW RATE (CFS) = 379.26  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \* ESTIMATED CHANNEL HEIGHT (FEET) = 1.96

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.96 FLOW VELOCITY (FEET/SEC.) = 13.92  
 LONGEST FLOWPATH FROM NODE 12111.00 TO NODE 12115.00 = 5473.45 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12115.00 TO NODE 12121.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1500.53 DOWNSTREAM(FEET) = 1215.72
CHANNEL LENGTH THRU SUBAREA(FEET) = 1875.45 CHANNEL SLOPE = 0.1519
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.25
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.195

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCSSOIL AREA Fp Ap SCSS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 62.55 0.30 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 432.60
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.34
AVERAGE FLOW DEPTH(FEET) = 2.24 TRAVEL TIME(MIN.) = 2.34
Tc(MIN.) = 22.60

SUBAREA AREA(ACRES) = 62.55 SUBAREA RUNOFF(CFS) = 106.66
EFFECTIVE AREA(ACRES) = 269.36 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 269.4 PEAK FLOW RATE(CFS) = 459.31
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.32 FLOW VELOCITY(FEET/SEC.) = 13.55
LONGEST FLOWPATH FROM NODE 12111.00 TO NODE 12121.00 = 7348.90 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 12115.00 TO NODE 12121.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 22.60
RAINFALL INTENSITY(INCH/HR) = 2.19
AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 269.36
TOTAL STREAM AREA(ACRES) = 269.36
PEAK FLOW RATE(CFS) AT CONFLUENCE = 459.31

\*\* CONFLUENCE DATA \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 3557.83 27.89 1.923 0.30( 0.30) 1.00 2347.7 12101.10
1 3782.16 38.87 1.606 0.30( 0.30) 1.00 3156.7 12010.00
1 3480.17 45.73 1.460 0.30( 0.30) 1.00 3281.5 12000.00
2 459.31 22.60 2.195 0.30( 0.30) 1.00 269.4 12111.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 3823.92 22.60 2.195 0.30( 0.30) 1.00 2171.4 12111.00
2 3951.33 27.89 1.923 0.30( 0.30) 1.00 2617.1 12101.10
3 4098.75 38.87 1.606 0.30( 0.30) 1.00 3426.1 12010.00
4 3761.41 45.73 1.460 0.30( 0.30) 1.00 3550.8 12000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 4098.75 Tc(MIN.) = 38.87
EFFECTIVE AREA(ACRES) = 3426.06 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 3550.8
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12121.00 = 27614.37 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 12121.00 TO NODE 12241.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1215.72 DOWNSTREAM(FEET) = 1122.29
CHANNEL LENGTH THRU SUBAREA(FEET) = 3397.13 CHANNEL SLOPE = 0.0275
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.40
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.512

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCSSOIL AREA Fp Ap SCSS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 136.41 0.30 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4173.13
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.05
AVERAGE FLOW DEPTH(FEET) = 10.39 TRAVEL TIME(MIN.) = 4.34
Tc(MIN.) = 43.21

SUBAREA AREA(ACRES) = 136.41 SUBAREA RUNOFF(CFS) = 148.76
EFFECTIVE AREA(ACRES) = 3562.47 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 3687.2 PEAK FLOW RATE(CFS) = 4098.75
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.30

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 10.30 FLOW VELOCITY(FEET/SEC.) = 13.00
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12241.00 = 31011.50 FEET.

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 3687.2 TC(MIN.) = 43.21
EFFECTIVE AREA(ACRES) = 3562.47 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.000
PEAK FLOW RATE(CFS) = 4098.75

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3823.92	27.00	1.961	0.30 ( 0.30)	1.00	2307.8	12111.00
2	3951.33	32.26	1.774	0.30 ( 0.30)	1.00	2753.5	12101.10
3	4098.75	43.21	1.512	0.30 ( 0.30)	1.00	3562.5	12010.00
4	3761.41	50.17	1.371	0.30 ( 0.30)	1.00	3687.2	12000.00

=====  
 END OF RATIONAL METHOD ANALYSIS  
 =====

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

Michael Baker International  
5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

-----  
FILE NAME: S22.DAT  
TIME/DATE OF STUDY: 08:11 07/16/2018  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.549
- 2) 10.00; 3.628
- 3) 15.00; 2.829
- 4) 20.00; 2.353
- 5) 25.00; 2.048
- 6) 30.00; 1.832
- 7) 40.00; 1.577
- 8) 50.00; 1.373
- 9) 60.00; 1.248
- 10) 90.00; 1.043
- 11) 120.00; 0.905
- 12) 180.00; 0.750
- 13) 360.00; 0.547
- 14) 1440.00; 0.235

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR	STREET MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 12201.00 TO NODE 12202.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 926.94  
ELEVATION DATA: UPSTREAM(FEET) = 3077.00 DOWNSTREAM(FEET) = 2740.64

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.295  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.102  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	-	5.74	0.30	1.000	0	13.29

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 14.47  
 TOTAL AREA(ACRES) = 5.74 PEAK FLOW RATE(CFS) = 14.47

\*\*\*\*\*

FLOW PROCESS FROM NODE 12202.00 TO NODE 12203.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2740.64 DOWNSTREAM(FEET) = 2551.60  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 832.53 CHANNEL SLOPE = 0.2271  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.50  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.795  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.85	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 35.69  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.73  
 AVERAGE FLOW DEPTH(FEET) = 0.48 TRAVEL TIME(MIN.) = 2.06  
 Tc(MIN.) = 15.36  
 SUBAREA AREA(ACRES) = 18.85 SUBAREA RUNOFF(CFS) = 42.33  
 EFFECTIVE AREA(ACRES) = 24.59 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 24.6 PEAK FLOW RATE(CFS) = 55.22  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.62

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.62 FLOW VELOCITY(FEET/SEC.) = 7.89  
 LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12203.00 = 1759.47 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12203.00 TO NODE 12204.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2551.60 DOWNSTREAM(FEET) = 2151.76  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2056.86 CHANNEL SLOPE = 0.1944  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.16

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.476

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	83.93	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 137.71

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.22

AVERAGE FLOW DEPTH(FEET) = 1.10 TRAVEL TIME(MIN.) = 3.35

Tc(MIN.) = 18.71

SUBAREA AREA(ACRES) = 83.93 SUBAREA RUNOFF(CFS) = 164.37

EFFECTIVE AREA(ACRES) = 108.52 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 108.5 PEAK FLOW RATE(CFS) = 212.52

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.41

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.41 FLOW VELOCITY(FEET/SEC.) = 11.71

LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12204.00 = 3816.33 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12204.00 TO NODE 12205.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2151.76 DOWNSTREAM(FEET) = 1788.16  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2363.99 CHANNEL SLOPE = 0.1538  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.12

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.244

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	182.26	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 372.18

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.82

AVERAGE FLOW DEPTH(FEET) = 2.06 TRAVEL TIME(MIN.) = 3.07

Tc(MIN.) = 21.78

SUBAREA AREA(ACRES) = 182.26 SUBAREA RUNOFF(CFS) = 318.94

EFFECTIVE AREA(ACRES) = 290.78 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 290.8 PEAK FLOW RATE(CFS) = 508.83

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.44

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.44 FLOW VELOCITY(FEET/SEC.) = 14.03

LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12205.00 = 6180.32 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12205.00 TO NODE 12206.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1788.16 DOWNSTREAM(FEET) = 1385.78  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2825.33 CHANNEL SLOPE = 0.1424  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.82

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.047

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	153.05	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 629.19

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.49

AVERAGE FLOW DEPTH(FEET) = 2.79 TRAVEL TIME(MIN.) = 3.25

Tc(MIN.) = 25.03

SUBAREA AREA(ACRES) = 153.05 SUBAREA RUNOFF(CFS) = 240.60

EFFECTIVE AREA(ACRES) = 443.83 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 443.8 PEAK FLOW RATE(CFS) = 697.71

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.94

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.94 FLOW VELOCITY(FEET/SEC.) = 14.93

LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12206.00 = 9005.65 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12206.00 TO NODE 12221.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1385.78 DOWNSTREAM(FEET) = 1006.12  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3579.23 CHANNEL SLOPE = 0.1061  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.42

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.861

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	132.52	0.30	1.000	-



SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 790.85  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 13.90  
 AVERAGE FLOW DEPTH( FEET) = 3.39 TRAVEL TIME( MIN.) = 4.29  
 Tc( MIN.) = 29.32  
 SUBAREA AREA( ACRES) = 132.52 SUBAREA RUNOFF( CFS) = 186.21  
 EFFECTIVE AREA( ACRES) = 576.35 AREA-AVERAGED Fm( INCH/HR) = 0.30  
 AREA-AVERAGED Fp( INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA( ACRES) = 576.4 PEAK FLOW RATE( CFS) = 809.87  
 GIVEN CHANNEL BASE( FEET) = 10.00 CHANNEL FREEBOARD( FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT( FEET) = 3.43

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH( FEET) = 3.43 FLOW VELOCITY( FEET/SEC.) = 14.00  
 LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12221.00 = 12584.88 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12206.00 TO NODE 12221.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION( MIN.) = 29.32  
 RAINFALL INTENSITY( INCH/HR) = 1.86  
 AREA-AVERAGED Fm( INCH/HR) = 0.30  
 AREA-AVERAGED Fp( INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA( ACRES) = 576.35  
 TOTAL STREAM AREA( ACRES) = 576.35  
 PEAK FLOW RATE( CFS) AT CONFLUENCE = 809.87

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12211.00 TO NODE 12212.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH( FEET) = 733.41  
 ELEVATION DATA: UPSTREAM( FEET) = 1669.93 DOWNSTREAM( FEET) = 1536.26

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc( MIN.) = 13.893  
 \* 100 YEAR RAINFALL INTENSITY( INCH/HR) = 3.006  
 SUBAREA Tc AND LOSS RATE DATA( AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "GRASS"	-	8.90	0.30	1.000	0	13.89

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp( INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF( CFS) = 21.67  
 TOTAL AREA( ACRES) = 8.90 PEAK FLOW RATE( CFS) = 21.67

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12212.00 TO NODE 12213.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM( FEET) = 1536.26 DOWNSTREAM( FEET) = 1416.02  
 CHANNEL LENGTH THRU SUBAREA( FEET) = 1253.05 CHANNEL SLOPE = 0.0960  
 GIVEN CHANNEL BASE( FEET) = 10.00 CHANNEL FREEBOARD( FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT( FEET) = 0.70  
 \* 100 YEAR RAINFALL INTENSITY( INCH/HR) = 2.562

SUBAREA LOSS RATE DATA( AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	17.91	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp( INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW( CFS) = 39.98  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 5.34  
 AVERAGE FLOW DEPTH( FEET) = 0.66 TRAVEL TIME( MIN.) = 3.91  
 Tc( MIN.) = 17.80

SUBAREA AREA( ACRES) = 17.91 SUBAREA RUNOFF( CFS) = 36.47  
 EFFECTIVE AREA( ACRES) = 26.81 AREA-AVERAGED Fm( INCH/HR) = 0.30  
 AREA-AVERAGED Fp( INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA( ACRES) = 26.8 PEAK FLOW RATE( CFS) = 54.59  
 GIVEN CHANNEL BASE( FEET) = 10.00 CHANNEL FREEBOARD( FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT( FEET) = 0.80

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH( FEET) = 0.80 FLOW VELOCITY( FEET/SEC.) = 5.91  
 LONGEST FLOWPATH FROM NODE 12211.00 TO NODE 12213.00 = 1986.46 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12213.00 TO NODE 12214.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM( FEET) = 1416.02 DOWNSTREAM( FEET) = 1234.66  
 CHANNEL LENGTH THRU SUBAREA( FEET) = 1877.62 CHANNEL SLOPE = 0.0966  
 GIVEN CHANNEL BASE( FEET) = 10.00 CHANNEL FREEBOARD( FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT( FEET) = 1.58  
 \* 100 YEAR RAINFALL INTENSITY( INCH/HR) = 2.263

SUBAREA LOSS RATE DATA( AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	125.19	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp( INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW( CFS) = 165.55  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 8.50  
 AVERAGE FLOW DEPTH( FEET) = 1.50 TRAVEL TIME( MIN.) = 3.68  
 Tc( MIN.) = 21.48

SUBAREA AREA( ACRES) = 125.19 SUBAREA RUNOFF( CFS) = 221.13  
 EFFECTIVE AREA( ACRES) = 152.00 AREA-AVERAGED Fm( INCH/HR) = 0.30  
 AREA-AVERAGED Fp( INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA( ACRES) = 152.0 PEAK FLOW RATE( CFS) = 268.49

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.96

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.96 FLOW VELOCITY (FEET/SEC.) = 9.87  
LONGEST FLOWPATH FROM NODE 12211.00 TO NODE 12214.00 = 3864.08 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12214.00 TO NODE 12221.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1234.66 DOWNSTREAM (FEET) = 1006.12  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2510.91 CHANNEL SLOPE = 0.0910  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.97  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.047

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	339.35	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 535.71  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.80  
AVERAGE FLOW DEPTH (FEET) = 2.88 TRAVEL TIME (MIN.) = 3.55  
Tc (MIN.) = 25.03  
SUBAREA AREA (ACRES) = 339.35 SUBAREA RUNOFF (CFS) = 533.49  
EFFECTIVE AREA (ACRES) = 491.35 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 491.4 PEAK FLOW RATE (CFS) = 772.45  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.48

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 3.48 FLOW VELOCITY (FEET/SEC.) = 13.07  
LONGEST FLOWPATH FROM NODE 12211.00 TO NODE 12221.00 = 6374.99 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12214.00 TO NODE 12221.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION (MIN.) = 25.03  
RAINFALL INTENSITY (INCH/HR) = 2.05  
AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA (ACRES) = 491.35  
TOTAL STREAM AREA (ACRES) = 491.35  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 772.45

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	809.87	29.32	1.861	0.30 ( 0.30)	1.00	576.4	12201.00
2	772.45	25.03	2.047	0.30 ( 0.30)	1.00	491.4	12211.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1545.86	25.03	2.047	0.30 ( 0.30)	1.00	983.3	12211.00
2	1500.30	29.32	1.861	0.30 ( 0.30)	1.00	1067.7	12201.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
PEAK FLOW RATE (CFS) = 1545.86 Tc (MIN.) = 25.03  
EFFECTIVE AREA (ACRES) = 983.32 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 1067.7  
LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12221.00 = 12584.88 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12221.00 TO NODE 12251.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1006.12 DOWNSTREAM (FEET) = 897.69  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2362.84 CHANNEL SLOPE = 0.0459  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 6.01  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.910

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	127.60	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1638.31  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.41  
AVERAGE FLOW DEPTH (FEET) = 6.00 TRAVEL TIME (MIN.) = 3.17  
Tc (MIN.) = 28.20  
SUBAREA AREA (ACRES) = 127.60 SUBAREA RUNOFF (CFS) = 184.86  
EFFECTIVE AREA (ACRES) = 1110.92 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 1195.3 PEAK FLOW RATE (CFS) = 1609.43  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.95

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 5.95 FLOW VELOCITY (FEET/SEC.) = 12.36  
LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12251.00 = 14947.72 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12221.00 TO NODE 12251.00 IS CODE = 10

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

\*\*\*\*\*

FLOW PROCESS FROM NODE 12231.00 TO NODE 12231.50 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH (FEET) = 553.71  
ELEVATION DATA: UPSTREAM (FEET) = 2687.04 DOWNSTREAM (FEET) = 2470.68

Tc = K \* [(LENGTH\*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20  
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 10.660  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.523  
SUBAREA Tc AND LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL, NARROWLEAF" - 3.48 0.30 1.000 0 10.66  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF (CFS) = 10.09  
TOTAL AREA (ACRES) = 3.48 PEAK FLOW RATE (CFS) = 10.09

\*\*\*\*\*

FLOW PROCESS FROM NODE 12231.50 TO NODE 12232.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 2470.68 DOWNSTREAM (FEET) = 2375.54  
CHANNEL LENGTH THRU SUBAREA (FEET) = 410.38 CHANNEL SLOPE = 0.2318  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.41  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.345  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 12.43 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 27.14  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.16  
AVERAGE FLOW DEPTH (FEET) = 0.41 TRAVEL TIME (MIN.) = 1.11  
Tc (MIN.) = 11.77  
SUBAREA AREA (ACRES) = 12.43 SUBAREA RUNOFF (CFS) = 34.07  
EFFECTIVE AREA (ACRES) = 15.91 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 15.9 PEAK FLOW RATE (CFS) = 43.61  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.54

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 0.54 FLOW VELOCITY (FEET/SEC.) = 7.31  
LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12232.00 = 964.09 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12232.00 TO NODE 12233.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 2375.54 DOWNSTREAM (FEET) = 2252.99  
CHANNEL LENGTH THRU SUBAREA (FEET) = 939.16 CHANNEL SLOPE = 0.1305  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.83  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.986  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 17.65 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 64.97  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.96  
AVERAGE FLOW DEPTH (FEET) = 0.80 TRAVEL TIME (MIN.) = 2.25  
Tc (MIN.) = 14.02  
SUBAREA AREA (ACRES) = 17.65 SUBAREA RUNOFF (CFS) = 42.67  
EFFECTIVE AREA (ACRES) = 33.56 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 33.6 PEAK FLOW RATE (CFS) = 81.13  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.91

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.91 FLOW VELOCITY (FEET/SEC.) = 7.52  
LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12233.00 = 1903.25 FEET.

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FLOW PROCESS FROM NODE 12233.00 TO NODE 12234.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 2252.99 DOWNSTREAM (FEET) = 2163.07  
CHANNEL LENGTH THRU SUBAREA (FEET) = 976.53 CHANNEL SLOPE = 0.0921  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.17  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.707  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 19.54 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 102.31  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.20  
AVERAGE FLOW DEPTH (FEET) = 1.15 TRAVEL TIME (MIN.) = 2.26

Tc(MIN.) = 16.28  
SUBAREA AREA(ACRES) = 19.54 SUBAREA RUNOFF(CFS) = 42.33  
EFFECTIVE AREA(ACRES) = 53.10 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 53.1 PEAK FLOW RATE(CFS) = 115.04  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.23

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.23 FLOW VELOCITY(FEET/SEC.) = 7.48  
LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12234.00 = 2879.78 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12234.00 TO NODE 12235.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2163.07 DOWNSTREAM(FEET) = 2018.08  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1909.65 CHANNEL SLOPE = 0.0759  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.63

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.330  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 51.14 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 161.86  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.77  
AVERAGE FLOW DEPTH(FEET) = 1.58 TRAVEL TIME(MIN.) = 4.10  
Tc(MIN.) = 20.37  
SUBAREA AREA(ACRES) = 51.14 SUBAREA RUNOFF(CFS) = 93.44  
EFFECTIVE AREA(ACRES) = 104.24 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 104.2 PEAK FLOW RATE(CFS) = 190.47  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.73

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.73 FLOW VELOCITY(FEET/SEC.) = 8.19  
LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12235.00 = 4789.43 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12235.00 TO NODE 12236.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2018.08 DOWNSTREAM(FEET) = 1607.89  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1896.94 CHANNEL SLOPE = 0.2162  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.45

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.175  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 47.44 0.30 1.000 -

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 230.52  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.46  
AVERAGE FLOW DEPTH(FEET) = 1.44 TRAVEL TIME(MIN.) = 2.54  
Tc(MIN.) = 22.91

SUBAREA AREA(ACRES) = 47.44 SUBAREA RUNOFF(CFS) = 80.07  
EFFECTIVE AREA(ACRES) = 151.68 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 151.7 PEAK FLOW RATE(CFS) = 256.02  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.52

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.52 FLOW VELOCITY(FEET/SEC.) = 12.89  
LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12236.00 = 6686.37 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12236.00 TO NODE 12237.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1607.89 DOWNSTREAM(FEET) = 1326.23  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2213.20 CHANNEL SLOPE = 0.1273  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.03

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.000  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 87.00 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 322.59  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.49  
AVERAGE FLOW DEPTH(FEET) = 2.00 TRAVEL TIME(MIN.) = 3.21  
Tc(MIN.) = 26.12  
SUBAREA AREA(ACRES) = 87.00 SUBAREA RUNOFF(CFS) = 133.08  
EFFECTIVE AREA(ACRES) = 238.68 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 238.7 PEAK FLOW RATE(CFS) = 365.10  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.15

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.15 FLOW VELOCITY(FEET/SEC.) = 11.90  
LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12237.00 = 8899.57 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12237.00 TO NODE 12241.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1326.23 DOWNSTREAM(FEET) = 1122.29
CHANNEL LENGTH THRU SUBAREA(FEET) = 2236.51 CHANNEL SLOPE = 0.0912
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.55
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.854

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 81.83 0.30 1.000 -

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 422.34

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.04

AVERAGE FLOW DEPTH(FEET) = 2.54 TRAVEL TIME(MIN.) = 3.38

Tc(MIN.) = 29.50

SUBAREA AREA(ACRES) = 81.83 SUBAREA RUNOFF(CFS) = 114.43

EFFECTIVE AREA(ACRES) = 320.51 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 320.5 PEAK FLOW RATE(CFS) = 448.19

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.62

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.62 FLOW VELOCITY(FEET/SEC.) = 11.23

LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12241.00 = 11136.08 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12237.00 TO NODE 12241.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<

\*\*\*\*\*

FLOW PROCESS FROM NODE 12241.00 TO NODE 12241.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<

PEAK FLOWRATE TABLE FILE NAME: S21.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM Q Tc Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (ACRES) NODE
1 3823.92 27.00 0.30( 0.30) 1.00 2307.8 12111.00
2 3951.33 32.26 0.30( 0.30) 1.00 2753.5 12101.10
3 4098.75 43.21 0.30( 0.30) 1.00 3562.5 12010.00
4 3761.41 50.17 0.30( 0.30) 1.00 3687.2 12000.00
TOTAL AREA(ACRES) = 3687.2

\*\*\*\*\*

FLOW PROCESS FROM NODE 12241.00 TO NODE 12241.00 IS CODE = 14.0

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM Q Tc Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (ACRES) NODE
1 3823.92 27.00 0.30( 0.30) 1.00 2307.8 12111.00
2 3951.33 32.26 0.30( 0.30) 1.00 2753.5 12101.10
3 4098.75 43.21 0.30( 0.30) 1.00 3562.5 12010.00
4 3761.41 50.17 0.30( 0.30) 1.00 3687.2 12000.00
TOTAL AREA(ACRES) = 3687.2

\*\*\*\*\*

FLOW PROCESS FROM NODE 12237.00 TO NODE 12241.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 3823.92 27.00 1.961 0.30( 0.30) 1.00 2307.8 12111.00
2 3951.33 32.26 1.774 0.30( 0.30) 1.00 2753.5 12101.10
3 4098.75 43.21 1.512 0.30( 0.30) 1.00 3562.5 12010.00
4 3761.41 50.17 1.371 0.30( 0.30) 1.00 3687.2 12000.00
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12241.00 = 31011.50 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 448.19 29.50 1.854 0.30( 0.30) 1.00 320.5 12231.00
LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12241.00 = 11136.08 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 4262.67 27.00 1.961 0.30( 0.30) 1.00 2601.2 12111.00
2 4332.51 29.50 1.854 0.30( 0.30) 1.00 2839.6 12231.00
3 4376.61 32.26 1.774 0.30( 0.30) 1.00 3074.0 12101.10
4 4448.27 43.21 1.512 0.30( 0.30) 1.00 3883.0 12010.00
5 4070.33 50.17 1.371 0.30( 0.30) 1.00 4007.7 12000.00
TOTAL AREA(ACRES) = 4007.7

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 4448.27 Tc(MIN.) = 43.206
EFFECTIVE AREA(ACRES) = 3882.98 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 4007.7
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12241.00 = 31011.50 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12241.00 TO NODE 12242.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1122.29 DOWNSTREAM(FEET) = 1062.50
CHANNEL LENGTH THRU SUBAREA(FEET) = 2053.03 CHANNEL SLOPE = 0.0291
GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 8.98  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.460  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	219.09	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 4562.61  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 13.43  
 AVERAGE FLOW DEPTH (FEET) = 8.96 TRAVEL TIME (MIN.) = 2.55  
 Tc (MIN.) = 45.75  
 SUBAREA AREA (ACRES) = 219.09 SUBAREA RUNOFF (CFS) = 228.67  
 EFFECTIVE AREA (ACRES) = 4102.07 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 4226.8 PEAK FLOW RATE (CFS) = 4448.27  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 20.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 8.85

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 8.85 FLOW VELOCITY (FEET/SEC.) = 13.33  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12242.00 = 33064.53 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12242.00 TO NODE 12243.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 1062.50 DOWNSTREAM (FEET) = 998.53  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1931.30 CHANNEL SLOPE = 0.0331  
 GIVEN CHANNEL BASE (FEET) = 20.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 8.70  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.413  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	249.96	0.30	0.995	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.995  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 4573.64  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 14.07  
 AVERAGE FLOW DEPTH (FEET) = 8.69 TRAVEL TIME (MIN.) = 2.29  
 Tc (MIN.) = 48.04  
 SUBAREA AREA (ACRES) = 249.96 SUBAREA RUNOFF (CFS) = 250.73  
 EFFECTIVE AREA (ACRES) = 4352.03 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 4476.8 PEAK FLOW RATE (CFS) = 4448.27  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 20.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 8.57

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 8.57 FLOW VELOCITY (FEET/SEC.) = 13.97  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12243.00 = 34995.83 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12243.00 TO NODE 12244.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 998.53 DOWNSTREAM (FEET) = 926.00  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1863.28 CHANNEL SLOPE = 0.0389  
 GIVEN CHANNEL BASE (FEET) = 20.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 8.31  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.371  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	166.97	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 4528.78  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 14.89  
 AVERAGE FLOW DEPTH (FEET) = 8.31 TRAVEL TIME (MIN.) = 2.09  
 Tc (MIN.) = 50.13  
 SUBAREA AREA (ACRES) = 166.97 SUBAREA RUNOFF (CFS) = 161.02  
 EFFECTIVE AREA (ACRES) = 4519.00 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 4643.8 PEAK FLOW RATE (CFS) = 4448.27  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 20.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 8.23

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 8.23 FLOW VELOCITY (FEET/SEC.) = 14.83  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12244.00 = 36859.11 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12244.00 TO NODE 12251.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 926.00 DOWNSTREAM (FEET) = 897.69  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1665.37 CHANNEL SLOPE = 0.0170  
 GIVEN CHANNEL BASE (FEET) = 20.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 10.16  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.340  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	83.41	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 4487.30  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.97

AVERAGE FLOW DEPTH(FEET) = 10.15 TRAVEL TIME(MIN.) = 2.53  
Tc(MIN.) = 52.66  
SUBAREA AREA(ACRES) = 83.41 SUBAREA RUNOFF(CFS) = 78.06  
EFFECTIVE AREA(ACRES) = 4602.41 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 4727.2 PEAK FLOW RATE(CFS) = 4448.27  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.11

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 10.11 FLOW VELOCITY(FEET/SEC.) = 10.94  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12251.00 = 38524.48 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12221.00 TO NODE 12251.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4262.67	36.55	1.665	0.30( 0.30)	1.00	3320.7	12111.00
2	4332.51	39.00	1.602	0.30( 0.30)	1.00	3559.0	12231.00
3	4376.61	41.74	1.541	0.30( 0.30)	1.00	3793.4	12101.10
4	4448.27	52.66	1.340	0.30( 0.30)	1.00	4602.4	12010.00
5	4105.99	59.84	1.250	0.30( 0.30)	1.00	4727.2	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12251.00 = 38524.48 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1609.43	28.20	1.910	0.30( 0.30)	1.00	1110.9	12211.00
2	1578.98	32.52	1.768	0.30( 0.30)	1.00	1195.3	12201.00

LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12251.00 = 14947.72 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5488.22	28.20	1.910	0.30( 0.30)	1.00	3673.5	12211.00
2	5657.38	32.52	1.768	0.30( 0.30)	1.00	4150.3	12201.00
3	5731.25	36.55	1.665	0.30( 0.30)	1.00	4516.0	12111.00
4	5733.65	39.00	1.602	0.30( 0.30)	1.00	4754.3	12231.00
5	5712.15	41.74	1.541	0.30( 0.30)	1.00	4988.7	12101.10
6	5566.91	52.66	1.340	0.30( 0.30)	1.00	5797.7	12010.00
7	5128.01	59.84	1.250	0.30( 0.30)	1.00	5922.5	12000.00

TOTAL AREA(ACRES) = 5922.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 5733.65 Tc(MIN.) = 39.005  
EFFECTIVE AREA(ACRES) = 4754.34 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 5922.5  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12251.00 = 38524.48 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12251.00 TO NODE 12281.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 897.69 DOWNSTREAM(FEET) = 846.91  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2133.08 CHANNEL SLOPE = 0.0238  
GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.59  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.543

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	85.79	0.30	1.000	-

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5781.62

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.27

AVERAGE FLOW DEPTH(FEET) = 10.58 TRAVEL TIME(MIN.) = 2.68

Tc(MIN.) = 41.68

SUBAREA AREA(ACRES) = 85.79 SUBAREA RUNOFF(CFS) = 95.95

EFFECTIVE AREA(ACRES) = 4840.13 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 6008.3 PEAK FLOW RATE(CFS) = 5733.65

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.54

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 10.54 FLOW VELOCITY(FEET/SEC.) = 13.24

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12281.00 = 40657.56 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12251.00 TO NODE 12281.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 41.68

RAINFALL INTENSITY(INCH/HR) = 1.54

AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA(ACRES) = 4840.13

TOTAL STREAM AREA(ACRES) = 6008.26

PEAK FLOW RATE(CFS) AT CONFLUENCE = 5733.65

\*\*\*\*\*

FLOW PROCESS FROM NODE 12261.00 TO NODE 12261.50 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 378.71

ELEVATION DATA: UPSTREAM(FEET) = 2264.27 DOWNSTREAM(FEET) = 2072.51

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.694  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.130  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	2.96	0.30	1.000	0	8.69

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 10.20  
 TOTAL AREA(ACRES) = 2.96 PEAK FLOW RATE(CFS) = 10.20

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12261.50 TO NODE 12262.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2072.51 DOWNSTREAM(FEET) = 1875.51  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 609.41 CHANNEL SLOPE = 0.3233  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.37  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.594  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	9.89	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 24.89  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.69  
 AVERAGE FLOW DEPTH(FEET) = 0.35 TRAVEL TIME(MIN.) = 1.52  
 Tc(MIN.) = 10.21

SUBAREA AREA(ACRES) = 9.89 SUBAREA RUNOFF(CFS) = 29.32  
 EFFECTIVE AREA(ACRES) = 12.85 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 12.9 PEAK FLOW RATE(CFS) = 38.09  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.45

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.45 FLOW VELOCITY(FEET/SEC.) = 7.71  
 LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12262.00 = 988.12 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12262.00 TO NODE 12263.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1875.51 DOWNSTREAM(FEET) = 1686.10  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 967.89 CHANNEL SLOPE = 0.1957  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.75  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.275  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	22.00	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 67.59  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.08  
 AVERAGE FLOW DEPTH(FEET) = 0.73 TRAVEL TIME(MIN.) = 2.00  
 Tc(MIN.) = 12.21  
 SUBAREA AREA(ACRES) = 22.00 SUBAREA RUNOFF(CFS) = 58.91  
 EFFECTIVE AREA(ACRES) = 34.85 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 34.8 PEAK FLOW RATE(CFS) = 93.31  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.88

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.88 FLOW VELOCITY(FEET/SEC.) = 8.99  
 LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12263.00 = 1956.01 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12263.00 TO NODE 12264.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 1686.10 DOWNSTREAM(FEET) = 1572.93  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 944.28 CHANNEL SLOPE = 0.1198  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.29  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.984  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	35.72	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 136.50  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.64  
 AVERAGE FLOW DEPTH(FEET) = 1.26 TRAVEL TIME(MIN.) = 1.82  
 Tc(MIN.) = 14.03  
 SUBAREA AREA(ACRES) = 35.72 SUBAREA RUNOFF(CFS) = 86.28  
 EFFECTIVE AREA(ACRES) = 70.57 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 70.6 PEAK FLOW RATE(CFS) = 170.47  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.43

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.43 FLOW VELOCITY(FEET/SEC.) = 9.26  
 LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12264.00 = 2900.29 FEET.



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FLOW PROCESS FROM NODE 12264.00 TO NODE 12265.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 1572.93 DOWNSTREAM(FEET) = 1506.41
CHANNEL LENGTH THRU SUBAREA(FEET) = 569.03 CHANNEL SLOPE = 0.1169
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.67
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.831
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp        Ap      SCS
LAND USE            GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -         43.21    0.30     0.886   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.886
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 220.36
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.92
AVERAGE FLOW DEPTH(FEET) = 1.67 TRAVEL TIME(MIN.) = 0.96
Tc(MIN.) = 14.99
SUBAREA AREA(ACRES) = 43.21 SUBAREA RUNOFF(CFS) = 99.77
EFFECTIVE AREA(ACRES) = 113.78 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 113.8 PEAK FLOW RATE(CFS) = 260.53
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.83

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.83 FLOW VELOCITY(FEET/SEC.) = 10.45
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12265.00 = 3469.32 FEET.

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FLOW PROCESS FROM NODE 12265.00 TO NODE 12266.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1506.41 DOWNSTREAM(FEET) = 1311.17
CHANNEL LENGTH THRU SUBAREA(FEET) = 2121.93 CHANNEL SLOPE = 0.0920
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.31
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.508
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp        Ap      SCS
LAND USE            GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -         84.55    0.30     0.710   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.710
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 347.97
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.46
AVERAGE FLOW DEPTH(FEET) = 2.28 TRAVEL TIME(MIN.) = 3.38
Tc(MIN.) = 18.37
SUBAREA AREA(ACRES) = 84.55 SUBAREA RUNOFF(CFS) = 174.67
EFFECTIVE AREA(ACRES) = 198.33 AREA-AVERAGED Fm(INCH/HR) = 0.26

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AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.85
TOTAL AREA(ACRES) = 198.3 PEAK FLOW RATE(CFS) = 402.14
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.47

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.47 FLOW VELOCITY(FEET/SEC.) = 10.91
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12266.00 = 5591.25 FEET.

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FLOW PROCESS FROM NODE 12266.00 TO NODE 12267.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1311.17 DOWNSTREAM(FEET) = 1232.47
CHANNEL LENGTH THRU SUBAREA(FEET) = 1555.18 CHANNEL SLOPE = 0.0506
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.45
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.288
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp        Ap      SCS
LAND USE            GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -         160.37   0.30     0.633   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.633
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 553.64
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.63
AVERAGE FLOW DEPTH(FEET) = 3.42 TRAVEL TIME(MIN.) = 2.69
Tc(MIN.) = 21.06
SUBAREA AREA(ACRES) = 160.37 SUBAREA RUNOFF(CFS) = 302.89
EFFECTIVE AREA(ACRES) = 358.70 AREA-AVERAGED Fm(INCH/HR) = 0.23
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.75
TOTAL AREA(ACRES) = 358.7 PEAK FLOW RATE(CFS) = 665.77
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.75

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.75 FLOW VELOCITY(FEET/SEC.) = 10.14
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12267.00 = 7146.43 FEET.

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FLOW PROCESS FROM NODE 12267.00 TO NODE 12268.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1232.47 DOWNSTREAM(FEET) = 1141.79
CHANNEL LENGTH THRU SUBAREA(FEET) = 2111.19 CHANNEL SLOPE = 0.0430
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 4.18
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.070
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp        Ap      SCS

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LAND USE            GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -         84.55    0.30     0.710   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.710
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 347.97
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.46
AVERAGE FLOW DEPTH(FEET) = 2.28 TRAVEL TIME(MIN.) = 3.38
Tc(MIN.) = 18.37
SUBAREA AREA(ACRES) = 84.55 SUBAREA RUNOFF(CFS) = 174.67
EFFECTIVE AREA(ACRES) = 198.33 AREA-AVERAGED Fm(INCH/HR) = 0.26

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LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 100.65 0.30 0.970 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.970  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 746.42  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.84  
AVERAGE FLOW DEPTH(FEET) = 4.15 TRAVEL TIME(MIN.) = 3.57  
Tc(MIN.) = 24.63  
SUBAREA AREA(ACRES) = 100.65 SUBAREA RUNOFF(CFS) = 161.19  
EFFECTIVE AREA(ACRES) = 459.35 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.80  
TOTAL AREA(ACRES) = 459.4 PEAK FLOW RATE(CFS) = 756.56  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.17

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 4.17 FLOW VELOCITY(FEET/SEC.) = 9.89  
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12268.00 = 9257.62 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12268.00 TO NODE 12269.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 1141.79 DOWNSTREAM(FEET) = 1115.83  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1295.17 CHANNEL SLOPE = 0.0200  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.31  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.942

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	103.26	0.30	0.838	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.838  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 835.14  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.67  
AVERAGE FLOW DEPTH(FEET) = 5.29 TRAVEL TIME(MIN.) = 2.81  
Tc(MIN.) = 27.45  
SUBAREA AREA(ACRES) = 103.26 SUBAREA RUNOFF(CFS) = 157.14  
EFFECTIVE AREA(ACRES) = 562.61 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.81  
TOTAL AREA(ACRES) = 562.6 PEAK FLOW RATE(CFS) = 860.76  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.37

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 5.37 FLOW VELOCITY(FEET/SEC.) = 7.73  
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12269.00 = 10552.79 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12269.00 TO NODE 12269.50 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 1115.83 DOWNSTREAM(FEET) = 1100.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1137.63 CHANNEL SLOPE = 0.0139  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.99  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.826

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	50.20	0.30	0.708	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.708  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 897.22  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.83  
AVERAGE FLOW DEPTH(FEET) = 5.98 TRAVEL TIME(MIN.) = 2.77  
Tc(MIN.) = 30.22  
SUBAREA AREA(ACRES) = 50.20 SUBAREA RUNOFF(CFS) = 72.92  
EFFECTIVE AREA(ACRES) = 612.81 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.80  
TOTAL AREA(ACRES) = 612.8 PEAK FLOW RATE(CFS) = 874.98  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.91

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 5.91 FLOW VELOCITY(FEET/SEC.) = 6.79  
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12269.50 = 11690.42 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12269.50 TO NODE 12270.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1100.00 DOWNSTREAM(FEET) = 1091.06  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1219.38 CHANNEL SLOPE = 0.0073  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.13  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.731

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	98.30	0.30	0.583	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.583  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 943.84  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.46  
AVERAGE FLOW DEPTH(FEET) = 7.13 TRAVEL TIME(MIN.) = 3.72  
Tc(MIN.) = 33.95  
SUBAREA AREA(ACRES) = 98.30 SUBAREA RUNOFF(CFS) = 137.71  
EFFECTIVE AREA(ACRES) = 711.11 AREA-AVERAGED Fm(INCH/HR) = 0.23  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.77  
TOTAL AREA(ACRES) = 711.1 PEAK FLOW RATE(CFS) = 960.32  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 7.18  
END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 7.18 FLOW VELOCITY (FEET/SEC.) = 5.49  
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12270.00 = 12909.80 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12270.00 TO NODE 12271.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1091.06 DOWNSTREAM (FEET) = 962.23  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1995.19 CHANNEL SLOPE = 0.0646  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 4.51  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.664

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	181.93	0.30	0.746	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.746

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1078.25

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.62

AVERAGE FLOW DEPTH (FEET) = 4.50 TRAVEL TIME (MIN.) = 2.64

Tc (MIN.) = 36.58

SUBAREA AREA (ACRES) = 181.93 SUBAREA RUNOFF (CFS) = 235.85

EFFECTIVE AREA (ACRES) = 893.04 AREA-AVERAGED Fm (INCH/HR) = 0.23

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.76

TOTAL AREA (ACRES) = 893.0 PEAK FLOW RATE (CFS) = 1153.16

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 4.65

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 4.65 FLOW VELOCITY (FEET/SEC.) = 12.84

LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12271.00 = 14904.99 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12271.00 TO NODE 12272.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 962.23 DOWNSTREAM (FEET) = 917.38  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1613.85 CHANNEL SLOPE = 0.0278  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.99

\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.593

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	181.79	0.30	0.910	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.910

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1261.17  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.65  
AVERAGE FLOW DEPTH (FEET) = 5.96 TRAVEL TIME (MIN.) = 2.79  
Tc (MIN.) = 39.37  
SUBAREA AREA (ACRES) = 181.79 SUBAREA RUNOFF (CFS) = 215.99  
EFFECTIVE AREA (ACRES) = 1074.83 AREA-AVERAGED Fm (INCH/HR) = 0.24  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.79  
TOTAL AREA (ACRES) = 1074.8 PEAK FLOW RATE (CFS) = 1312.00  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 6.08

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 6.08 FLOW VELOCITY (FEET/SEC.) = 9.74

LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12272.00 = 16518.84 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12272.00 TO NODE 12281.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 917.38 DOWNSTREAM (FEET) = 846.91  
CHANNEL LENGTH THRU SUBAREA (FEET) = 3182.34 CHANNEL SLOPE = 0.0221  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 6.53

\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.470

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	79.99	0.30	0.948	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.948

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1354.68

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.03

AVERAGE FLOW DEPTH (FEET) = 6.51 TRAVEL TIME (MIN.) = 5.87

Tc (MIN.) = 45.24

SUBAREA AREA (ACRES) = 79.99 SUBAREA RUNOFF (CFS) = 85.36

EFFECTIVE AREA (ACRES) = 1154.82 AREA-AVERAGED Fm (INCH/HR) = 0.24

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.80

TOTAL AREA (ACRES) = 1154.8 PEAK FLOW RATE (CFS) = 1312.00

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 6.42

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 6.42 FLOW VELOCITY (FEET/SEC.) = 8.95

LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12281.00 = 19701.18 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12272.00 TO NODE 12281.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 45.24  
 RAINFALL INTENSITY(INCH/HR) = 1.47  
 AREA-AVERAGED Fm(INCH/HR) = 0.24  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.80  
 EFFECTIVE STREAM AREA(ACRES) = 1154.82  
 TOTAL STREAM AREA(ACRES) = 1154.82  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 1312.00

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5488.22	30.91	1.809	0.30( 0.30)	1.00	3759.3	12211.00
1	5657.38	35.21	1.699	0.30( 0.30)	1.00	4236.1	12201.00
1	5731.25	39.23	1.597	0.30( 0.30)	1.00	4601.8	12111.00
1	5733.65	41.68	1.543	0.30( 0.30)	1.00	4840.1	12231.00
1	5712.15	44.43	1.487	0.30( 0.30)	1.00	5074.5	12101.10
1	5566.91	55.36	1.306	0.30( 0.30)	1.00	5883.5	12010.00
1	5128.01	62.60	1.230	0.30( 0.30)	1.00	6008.3	12000.00
2	1312.00	45.24	1.470	0.30( 0.24)	0.80	1154.8	12261.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6631.48	30.91	1.809	0.30( 0.29)	0.97	4548.3	12211.00
2	6868.61	35.21	1.699	0.30( 0.29)	0.96	5134.8	12201.00
3	6985.95	39.23	1.597	0.30( 0.29)	0.96	5603.1	12111.00
4	7013.81	41.68	1.543	0.30( 0.29)	0.96	5904.2	12231.00
5	7017.94	44.43	1.487	0.30( 0.29)	0.96	6208.5	12101.10
6	7013.33	45.24	1.470	0.30( 0.29)	0.96	6289.6	12261.00
7	6703.91	55.36	1.306	0.30( 0.29)	0.97	7038.3	12010.00
8	6184.15	62.60	1.230	0.30( 0.29)	0.97	7163.1	12000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 7017.94 Tc(MIN.) = 44.43  
 EFFECTIVE AREA(ACRES) = 6208.54 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA(ACRES) = 7163.1  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12281.00 = 40657.56 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12281.00 TO NODE 12282.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 846.91 DOWNSTREAM(FEET) = 835.60  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1561.00 CHANNEL SLOPE = 0.0072  
 GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 15.54  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.428  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 267.56 0.30 0.867 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.867  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7158.55  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.03  
 AVERAGE FLOW DEPTH(FEET) = 15.53 TRAVEL TIME(MIN.) = 2.88  
 Tc(MIN.) = 47.31  
 SUBAREA AREA(ACRES) = 267.56 SUBAREA RUNOFF(CFS) = 281.23  
 EFFECTIVE AREA(ACRES) = 6476.10 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA(ACRES) = 7430.6 PEAK FLOW RATE(CFS) = 7017.94  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 20.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 15.39

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 15.39 FLOW VELOCITY(FEET/SEC.) = 8.98  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12282.00 = 42218.56 FEET.

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 7430.6 TC(MIN.) = 47.31  
 EFFECTIVE AREA(ACRES) = 6476.10 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.959  
 PEAK FLOW RATE(CFS) = 7017.94

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6631.48	33.83	1.734	0.30( 0.29)	0.96	4815.9	12211.00
2	6868.61	38.10	1.625	0.30( 0.29)	0.96	5402.4	12201.00
3	6985.95	42.11	1.534	0.30( 0.29)	0.96	5870.6	12111.00
4	7013.81	44.57	1.484	0.30( 0.29)	0.96	6171.7	12231.00
5	7017.94	47.31	1.428	0.30( 0.29)	0.96	6476.1	12101.10
6	7013.33	48.12	1.411	0.30( 0.29)	0.96	6557.1	12261.00
7	6703.91	58.27	1.270	0.30( 0.29)	0.96	7305.9	12010.00
8	6184.15	65.58	1.210	0.30( 0.29)	0.96	7430.6	12000.00

=====

END OF RATIONAL METHOD ANALYSIS

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

Michael Baker International  
5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

-----  
FILE NAME: S23.DAT  
TIME/DATE OF STUDY: 08:12 07/16/2018  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.549
- 2) 10.00; 3.628
- 3) 15.00; 2.829
- 4) 20.00; 2.353
- 5) 25.00; 2.048
- 6) 30.00; 1.832
- 7) 40.00; 1.577
- 8) 50.00; 1.373
- 9) 60.00; 1.248
- 10) 90.00; 1.043
- 11) 120.00; 0.905
- 12) 180.00; 0.750
- 13) 360.00; 0.547
- 14) 1440.00; 0.235

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / SIDE /	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12300.00 TO NODE 12301.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 924.36  
ELEVATION DATA: UPSTREAM(FEET) = 1712.53 DOWNSTREAM(FEET) = 1490.12

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 14.417  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.922

SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)

NATURAL FAIR COVER  
"GRASS" - 6.66 0.30 1.000 0 14.42  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 15.72  
TOTAL AREA(ACRES) = 6.66 PEAK FLOW RATE(CFS) = 15.72

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12301.00 TO NODE 12302.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1490.12 DOWNSTREAM(FEET) = 1117.78  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1564.45 CHANNEL SLOPE = 0.2380  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.66  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.579

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN

USER-DEFINED - 39.97 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 56.89  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.12  
AVERAGE FLOW DEPTH(FEET) = 0.62 TRAVEL TIME(MIN.) = 3.21  
Tc(MIN.) = 17.63

SUBAREA AREA(ACRES) = 39.97 SUBAREA RUNOFF(CFS) = 81.98  
EFFECTIVE AREA(ACRES) = 46.63 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 46.6 PEAK FLOW RATE(CFS) = 95.64  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.84

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.84 FLOW VELOCITY(FEET/SEC.) = 9.70  
LONGEST FLOWPATH FROM NODE 12300.00 TO NODE 12302.00 = 2488.81 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12302.00 TO NODE 12320.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1117.78 DOWNSTREAM(FEET) = 780.80  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2216.41 CHANNEL SLOPE = 0.1520  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.24  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.260  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 51.51 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 141.15  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.46  
AVERAGE FLOW DEPTH(FEET) = 1.20 TRAVEL TIME(MIN.) = 3.90  
Tc(MIN.) = 21.53  
SUBAREA AREA(ACRES) = 51.51 SUBAREA RUNOFF(CFS) = 90.85  
EFFECTIVE AREA(ACRES) = 98.14 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 98.1 PEAK FLOW RATE(CFS) = 173.09  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.35

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.35 FLOW VELOCITY(FEET/SEC.) = 10.12  
LONGEST FLOWPATH FROM NODE 12300.00 TO NODE 12320.00 = 4705.22 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12302.00 TO NODE 12320.00 IS CODE = 10

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

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12282.00 TO NODE 12282.00 IS CODE = 15.1

-----  
>>>>DEFINE MEMORY BANK # 2 <<<<

PEAK FLOWRATE TABLE FILE NAME: S22.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6631.48	33.83	0.30 ( 0.29)	0.96	4815.9	12211.00
2	6868.61	38.10	0.30 ( 0.29)	0.96	5402.4	12201.00
3	6985.95	42.11	0.30 ( 0.29)	0.96	5870.6	12111.00
4	7013.81	44.57	0.30 ( 0.29)	0.96	6171.7	12231.00
5	7017.94	47.31	0.30 ( 0.29)	0.96	6476.1	12101.10
6	7013.33	48.12	0.30 ( 0.29)	0.96	6557.1	12261.00
7	6703.91	58.27	0.30 ( 0.29)	0.96	7305.9	12010.00
8	6184.15	65.58	0.30 ( 0.29)	0.96	7430.6	12000.00
TOTAL AREA(ACRES) =		7430.6				

\*\*\*\*\*

FLOW PROCESS FROM NODE 12282.00 TO NODE 12282.00 IS CODE = 14.0

-----  
>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<

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MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6631.48	33.83	0.30 ( 0.29)	0.96	4815.9	12211.00
2	6868.61	38.10	0.30 ( 0.29)	0.96	5402.4	12201.00
3	6985.95	42.11	0.30 ( 0.29)	0.96	5870.6	12111.00
4	7013.81	44.57	0.30 ( 0.29)	0.96	6171.7	12231.00
5	7017.94	47.31	0.30 ( 0.29)	0.96	6476.1	12101.10
6	7013.33	48.12	0.30 ( 0.29)	0.96	6557.1	12261.00
7	6703.91	58.27	0.30 ( 0.29)	0.96	7305.9	12010.00
8	6184.15	65.58	0.30 ( 0.29)	0.96	7430.6	12000.00
TOTAL AREA(ACRES) =		7430.6				

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12282.00 TO NODE 12320.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 835.60 DOWNSTREAM(FEET) = 780.80  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1568.10 CHANNEL SLOPE = 0.0349  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.58  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.392  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 51.15 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7043.07  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.73  
AVERAGE FLOW DEPTH(FEET) = 8.58 TRAVEL TIME(MIN.) = 1.77  
Tc(MIN.) = 49.08  
SUBAREA AREA(ACRES) = 51.15 SUBAREA RUNOFF(CFS) = 50.26  
EFFECTIVE AREA(ACRES) = 6527.25 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
TOTAL AREA(ACRES) = 7481.8 PEAK FLOW RATE(CFS) = 7017.94  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.56

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 8.56 FLOW VELOCITY(FEET/SEC.) = 14.72  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12320.00 = 43786.66 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12302.00 TO NODE 12320.00 IS CODE = 11

-----  
>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6631.48	35.63	1.688	0.30 ( 0.29)	0.96	4867.0	12211.00
2	6868.61	39.89	1.580	0.30 ( 0.29)	0.96	5453.5	12201.00
3	6985.95	43.89	1.498	0.30 ( 0.29)	0.96	5921.8	12111.00
4	7013.81	46.34	1.448	0.30 ( 0.29)	0.96	6222.9	12231.00
5	7017.94	49.08	1.392	0.30 ( 0.29)	0.96	6527.2	12101.10
6	7013.33	49.90	1.375	0.30 ( 0.29)	0.96	6608.3	12261.00
7	6703.91	60.07	1.248	0.30 ( 0.29)	0.96	7357.0	12010.00
8	6184.15	67.42	1.197	0.30 ( 0.29)	0.96	7481.8	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12320.00 = 43786.66 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	173.09	21.53	2.260	0.30 ( 0.30)	1.00	98.1	12300.00

LONGEST FLOWPATH FROM NODE 12300.00 TO NODE 12320.00 = 4705.22 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5814.82	21.53	2.260	0.30 ( 0.29)	0.96	3039.2	12300.00
2	6754.12	35.63	1.688	0.30 ( 0.29)	0.96	4965.2	12211.00
3	6981.67	39.89	1.580	0.30 ( 0.29)	0.96	5551.7	12201.00
4	7091.74	43.89	1.498	0.30 ( 0.29)	0.96	6019.9	12111.00
5	7115.19	46.34	1.448	0.30 ( 0.29)	0.96	6321.0	12231.00
6	7114.37	49.08	1.392	0.30 ( 0.29)	0.96	6625.4	12101.10
7	7108.30	49.90	1.375	0.30 ( 0.29)	0.96	6706.4	12261.00
8	6787.60	60.07	1.248	0.30 ( 0.29)	0.96	7455.2	12010.00
9	6263.41	67.42	1.197	0.30 ( 0.29)	0.96	7579.9	12000.00

TOTAL AREA (ACRES) = 7579.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 7115.19 Tc(MIN.) = 46.340  
EFFECTIVE AREA(ACRES) = 6321.02 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
TOTAL AREA(ACRES) = 7579.9  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12320.00 = 43786.66 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12320.00 TO NODE 12321.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 780.80 DOWNSTREAM(FEET) = 761.66  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2102.41 CHANNEL SLOPE = 0.0091  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 12.05  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.370

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	180.82	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7202.29  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.05  
AVERAGE FLOW DEPTH(FEET) = 12.03 TRAVEL TIME(MIN.) = 3.87  
Tc(MIN.) = 50.21  
SUBAREA AREA(ACRES) = 180.82 SUBAREA RUNOFF(CFS) = 174.20  
EFFECTIVE AREA(ACRES) = 6501.84 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
TOTAL AREA(ACRES) = 7760.8 PEAK FLOW RATE(CFS) = 7115.19  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.97

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 11.97 FLOW VELOCITY(FEET/SEC.) = 9.02  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12321.00 = 45889.07 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12321.00 TO NODE 12322.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 761.66 DOWNSTREAM(FEET) = 710.30  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1916.13 CHANNEL SLOPE = 0.0268  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 9.28  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.341

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	217.17	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7216.90  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.46  
AVERAGE FLOW DEPTH(FEET) = 9.27 TRAVEL TIME(MIN.) = 2.37  
Tc(MIN.) = 52.58

SUBAREA AREA(ACRES) = 217.17 SUBAREA RUNOFF(CFS) = 203.42  
EFFECTIVE AREA(ACRES) = 6719.01 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
TOTAL AREA(ACRES) = 7977.9 PEAK FLOW RATE(CFS) = 7115.19  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 9.21

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 9.21 FLOW VELOCITY(FEET/SEC.) = 13.41  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12322.00 = 47805.20 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12322.00 TO NODE 12340.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 710.30 DOWNSTREAM(FEET) = 678.19
CHANNEL LENGTH THRU SUBAREA(FEET) = 1977.07 CHANNEL SLOPE = 0.0162
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 10.48
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.304
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 194.67 0.30 0.999 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.999
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7203.17
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.20
AVERAGE FLOW DEPTH(FEET) = 10.47 TRAVEL TIME(MIN.) = 2.94
Tc(MIN.) = 55.53
SUBAREA AREA(ACRES) = 194.67 SUBAREA RUNOFF(CFS) = 175.96
EFFECTIVE AREA(ACRES) = 6913.68 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 8172.6 PEAK FLOW RATE(CFS) = 7115.19
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 10.41

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 10.41 FLOW VELOCITY(FEET/SEC.) = 11.16
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12340.00 = 49782.27 FEET.

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*****
FLOW PROCESS FROM NODE 12322.00 TO NODE 12340.00 IS CODE = 1
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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
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TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 55.53
RAINFALL INTENSITY(INCH/HR) = 1.30
AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.96
EFFECTIVE STREAM AREA(ACRES) = 6913.68
TOTAL STREAM AREA(ACRES) = 8172.59
PEAK FLOW RATE(CFS) AT CONFLUENCE = 7115.19

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*****
FLOW PROCESS FROM NODE 12330.00 TO NODE 12331.00 IS CODE = 21
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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
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INITIAL SUBAREA FLOW-LENGTH(FEET) = 994.42
ELEVATION DATA: UPSTREAM(FEET) = 1754.00 DOWNSTREAM(FEET) = 1530.30

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Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 15.046
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.825

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SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"GRASS" - 3.33 0.30 1.000 0 15.05
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 7.57
TOTAL AREA(ACRES) = 3.33 PEAK FLOW RATE(CFS) = 7.57

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*****
FLOW PROCESS FROM NODE 12331.00 TO NODE 12332.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 1530.30 DOWNSTREAM(FEET) = 1412.81
CHANNEL LENGTH THRU SUBAREA(FEET) = 946.66 CHANNEL SLOPE = 0.1241
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 0.61
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.558
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 28.08 0.30 1.000 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 36.19
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.62
AVERAGE FLOW DEPTH(FEET) = 0.58 TRAVEL TIME(MIN.) = 2.81
Tc(MIN.) = 17.85
SUBAREA AREA(ACRES) = 28.08 SUBAREA RUNOFF(CFS) = 57.05
EFFECTIVE AREA(ACRES) = 31.41 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 31.4 PEAK FLOW RATE(CFS) = 63.82
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 0.81

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.81 FLOW VELOCITY(FEET/SEC.) = 6.82
LONGEST FLOWPATH FROM NODE 12330.00 TO NODE 12332.00 = 1941.08 FEET.

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FLOW PROCESS FROM NODE 12332.00 TO NODE 12333.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 1412.81 DOWNSTREAM(FEET) = 1235.19
CHANNEL LENGTH THRU SUBAREA(FEET) = 1959.37 CHANNEL SLOPE = 0.0907
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.21
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.206
SUBAREA LOSS RATE DATA(AMC II):

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DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS

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LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 44.96 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 102.49  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.15  
 AVERAGE FLOW DEPTH(FEET) = 1.16 TRAVEL TIME(MIN.) = 4.57  
 Tc(MIN.) = 22.42  
 SUBAREA AREA(ACRES) = 44.96 SUBAREA RUNOFF(CFS) = 77.11  
 EFFECTIVE AREA(ACRES) = 76.37 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 76.4 PEAK FLOW RATE(CFS) = 130.98  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.33

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.33 FLOW VELOCITY(FEET/SEC.) = 7.76  
 LONGEST FLOWPATH FROM NODE 12330.00 TO NODE 12333.00 = 3900.45 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12333.00 TO NODE 12334.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1235.19 DOWNSTREAM(FEET) = 1013.96  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1921.81 CHANNEL SLOPE = 0.1151  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.38  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.003  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	30.50	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 154.37  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.86  
 AVERAGE FLOW DEPTH(FEET) = 1.37 TRAVEL TIME(MIN.) = 3.62  
 Tc(MIN.) = 26.03  
 SUBAREA AREA(ACRES) = 30.50 SUBAREA RUNOFF(CFS) = 46.76  
 EFFECTIVE AREA(ACRES) = 106.87 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 106.9 PEAK FLOW RATE(CFS) = 163.84  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.42

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.42 FLOW VELOCITY(FEET/SEC.) = 9.02  
 LONGEST FLOWPATH FROM NODE 12330.00 TO NODE 12334.00 = 5822.26 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12334.00 TO NODE 12335.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1013.96 DOWNSTREAM(FEET) = 809.84  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2029.80 CHANNEL SLOPE = 0.1006  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.96  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.857  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	145.82	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 266.10  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.98  
 AVERAGE FLOW DEPTH(FEET) = 1.93 TRAVEL TIME(MIN.) = 3.39  
 Tc(MIN.) = 29.42  
 SUBAREA AREA(ACRES) = 145.82 SUBAREA RUNOFF(CFS) = 204.33  
 EFFECTIVE AREA(ACRES) = 252.69 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 252.7 PEAK FLOW RATE(CFS) = 354.08  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.25

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.25 FLOW VELOCITY(FEET/SEC.) = 10.87  
 LONGEST FLOWPATH FROM NODE 12330.00 TO NODE 12335.00 = 7852.06 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12335.00 TO NODE 12340.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 809.84 DOWNSTREAM(FEET) = 678.19  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1905.44 CHANNEL SLOPE = 0.0691  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.62  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.764  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	50.71	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 387.49  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.74  
 AVERAGE FLOW DEPTH(FEET) = 2.61 TRAVEL TIME(MIN.) = 3.26  
 Tc(MIN.) = 32.68  
 SUBAREA AREA(ACRES) = 50.71 SUBAREA RUNOFF(CFS) = 66.80  
 EFFECTIVE AREA(ACRES) = 303.40 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 303.4 PEAK FLOW RATE(CFS) = 399.66  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.65

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 2.65 FLOW VELOCITY (FEET/SEC.) = 9.85  
LONGEST FLOWPATH FROM NODE 12330.00 TO NODE 12340.00 = 9757.50 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12335.00 TO NODE 12340.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<  
-----

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION (MIN.) = 32.68  
RAINFALL INTENSITY (INCH/HR) = 1.76  
AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA (ACRES) = 303.40  
TOTAL STREAM AREA (ACRES) = 303.40  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 399.66

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5814.82	31.20	1.802	0.30 ( 0.29)	0.97	3631.9	12300.00
1	6754.12	44.94	1.476	0.30 ( 0.29)	0.97	5557.8	12211.00
1	6981.67	49.11	1.391	0.30 ( 0.29)	0.96	6144.3	12201.00
1	7091.74	53.08	1.335	0.30 ( 0.29)	0.96	6612.6	12111.00
1	7115.19	55.53	1.304	0.30 ( 0.29)	0.96	6913.7	12231.00
1	7114.37	58.27	1.270	0.30 ( 0.29)	0.96	7218.0	12101.10
1	7108.30	59.08	1.259	0.30 ( 0.29)	0.96	7299.1	12261.00
1	6787.60	69.37	1.184	0.30 ( 0.29)	0.97	8047.8	12010.00
1	6263.41	76.92	1.132	0.30 ( 0.29)	0.97	8172.6	12000.00
2	399.66	32.68	1.764	0.30 ( 0.30)	1.00	303.4	12330.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6206.18	31.20	1.802	0.30 ( 0.29)	0.97	3921.5	12300.00
2	6316.16	32.68	1.764	0.30 ( 0.29)	0.97	4143.8	12330.00
3	7075.33	44.94	1.476	0.30 ( 0.29)	0.97	5861.2	12211.00
4	7279.61	49.11	1.391	0.30 ( 0.29)	0.97	6447.7	12201.00
5	7374.25	53.08	1.335	0.30 ( 0.29)	0.97	6916.0	12111.00
6	7389.34	55.53	1.304	0.30 ( 0.29)	0.97	7217.1	12231.00
7	7379.15	58.27	1.270	0.30 ( 0.29)	0.96	7521.4	12101.10
8	7370.30	59.08	1.259	0.30 ( 0.29)	0.96	7602.5	12261.00
9	7028.99	69.37	1.184	0.30 ( 0.29)	0.97	8351.2	12010.00
10	6490.72	76.92	1.132	0.30 ( 0.29)	0.97	8476.0	12000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 7389.34 Tc (MIN.) = 55.53  
EFFECTIVE AREA (ACRES) = 7217.08 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97

TOTAL AREA (ACRES) = 8476.0  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12340.00 = 49782.27 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12340.00 TO NODE 12341.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<  
-----

ELEVATION DATA: UPSTREAM (FEET) = 678.19 DOWNSTREAM (FEET) = 630.21  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2827.23 CHANNEL SLOPE = 0.0170  
GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 10.60  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.253  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 317.33 0.30 0.999 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.999  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 7525.45  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.51  
AVERAGE FLOW DEPTH (FEET) = 10.58 TRAVEL TIME (MIN.) = 4.09  
Tc (MIN.) = 59.62

SUBAREA AREA (ACRES) = 317.33 SUBAREA RUNOFF (CFS) = 272.22  
EFFECTIVE AREA (ACRES) = 7534.41 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA (ACRES) = 8793.3 PEAK FLOW RATE (CFS) = 7389.34  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 10.49

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 10.49 FLOW VELOCITY (FEET/SEC.) = 11.46  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12341.00 = 52609.50 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12341.00 TO NODE 12342.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<  
-----

ELEVATION DATA: UPSTREAM (FEET) = 630.21 DOWNSTREAM (FEET) = 601.66  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2006.47 CHANNEL SLOPE = 0.0142  
GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 10.99  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.229  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 124.13 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 7441.26  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.76

AVERAGE FLOW DEPTH(FEET) = 10.98 TRAVEL TIME(MIN.) = 3.11  
 Tc(MIN.) = 62.73  
 SUBAREA AREA(ACRES) = 124.13 SUBAREA RUNOFF(CFS) = 103.83  
 EFFECTIVE AREA(ACRES) = 7658.54 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 8917.5 PEAK FLOW RATE(CFS) = 7389.34  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 10.95

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 10.95 FLOW VELOCITY(FEET/SEC.) = 10.74  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12342.00 = 54615.97 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12342.00 TO NODE 12425.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 601.66 DOWNSTREAM(FEET) = 572.29  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1884.49 CHANNEL SLOPE = 0.0156  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 10.74  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.210

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	96.92	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7429.04  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.12  
 AVERAGE FLOW DEPTH(FEET) = 10.74 TRAVEL TIME(MIN.) = 2.82  
 Tc(MIN.) = 65.55  
 SUBAREA AREA(ACRES) = 96.92 SUBAREA RUNOFF(CFS) = 79.39  
 EFFECTIVE AREA(ACRES) = 7755.46 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 9014.4 PEAK FLOW RATE(CFS) = 7389.34  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 10.71

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 10.71 FLOW VELOCITY(FEET/SEC.) = 11.11  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12425.00 = 56500.46 FEET.

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 9014.4 TC(MIN.) = 65.55  
 EFFECTIVE AREA(ACRES) = 7755.46 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.968  
 PEAK FLOW RATE(CFS) = 7389.34

\*\* PEAK FLOW RATE TABLE \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
--------	---	----	-----------	--------	----	----	-----------

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE
1	6206.18	41.67	1.543	0.30( 0.29)	0.97	4459.8 12300.00
2	6316.16	43.11	1.513	0.30( 0.29)	0.97	4682.1 12330.00
3	7075.33	55.07	1.310	0.30( 0.29)	0.97	6399.6 12211.00
4	7279.61	59.17	1.258	0.30( 0.29)	0.97	6986.1 12201.00
5	7374.25	63.10	1.227	0.30( 0.29)	0.97	7454.3 12111.00
6	7389.34	65.55	1.210	0.30( 0.29)	0.97	7755.5 12231.00
7	7379.15	68.30	1.191	0.30( 0.29)	0.97	8059.8 12101.10
8	7370.30	69.12	1.186	0.30( 0.29)	0.97	8140.9 12261.00
9	7028.99	79.53	1.115	0.30( 0.29)	0.97	8889.6 12010.00
10	6490.72	87.30	1.061	0.30( 0.29)	0.97	9014.4 12000.00

END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*

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

Michael Baker International  
5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

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FILE NAME: S24.DAT  
TIME/DATE OF STUDY: 08:13 07/16/2018  
=====

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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14  
1) 5.00; 5.549  
2) 10.00; 3.628  
3) 15.00; 2.829  
4) 20.00; 2.353  
5) 25.00; 2.048  
6) 30.00; 1.832  
7) 40.00; 1.577  
8) 50.00; 1.373  
9) 60.00; 1.248  
10) 90.00; 1.043  
11) 120.00; 0.905  
12) 180.00; 0.750  
13) 360.00; 0.547  
14) 1440.00; 0.235

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

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

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 12400.00 TO NODE 12401.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 981.52  
ELEVATION DATA: UPSTREAM(FEET) = 2579.17 DOWNSTREAM(FEET) = 2249.14

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.811  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.019

SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 8.82 0.30 1.000 0 13.81  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 21.58  
TOTAL AREA(ACRES) = 8.82 PEAK FLOW RATE(CFS) = 21.58

\*\*\*\*\*

FLOW PROCESS FROM NODE 12401.00 TO NODE 12402.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2249.14 DOWNSTREAM(FEET) = 2103.89  
CHANNEL LENGTH THRU SUBAREA(FEET) = 975.11 CHANNEL SLOPE = 0.1490  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.86  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.736  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 46.29 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 72.47  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.52  
AVERAGE FLOW DEPTH(FEET) = 0.83 TRAVEL TIME(MIN.) = 2.16  
Tc(MIN.) = 15.97  
SUBAREA AREA(ACRES) = 46.29 SUBAREA RUNOFF(CFS) = 101.51  
EFFECTIVE AREA(ACRES) = 55.11 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 55.1 PEAK FLOW RATE(CFS) = 120.85  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.11

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.11 FLOW VELOCITY(FEET/SEC.) = 8.92  
LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12402.00 = 1956.63 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12402.00 TO NODE 12403.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2103.89 DOWNSTREAM(FEET) = 1771.34  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1880.50 CHANNEL SLOPE = 0.1768  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.32

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.456

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	54.97	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 174.29

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.64

AVERAGE FLOW DEPTH(FEET) = 1.30 TRAVEL TIME(MIN.) = 2.95

Tc(MIN.) = 18.92

SUBAREA AREA(ACRES) = 54.97 SUBAREA RUNOFF(CFS) = 106.67

EFFECTIVE AREA(ACRES) = 110.08 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 110.1 PEAK FLOW RATE(CFS) = 213.62

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.45

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.45 FLOW VELOCITY(FEET/SEC.) = 11.38

LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12403.00 = 3837.13 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12403.00 TO NODE 12404.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1771.34 DOWNSTREAM(FEET) = 1462.30  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2888.53 CHANNEL SLOPE = 0.1070  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.14

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.145

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	123.02	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 316.02

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.73

AVERAGE FLOW DEPTH(FEET) = 2.08 TRAVEL TIME(MIN.) = 4.49

Tc(MIN.) = 23.40

SUBAREA AREA(ACRES) = 123.02 SUBAREA RUNOFF(CFS) = 204.32

EFFECTIVE AREA(ACRES) = 233.10 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 233.1 PEAK FLOW RATE(CFS) = 387.15

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.32 FLOW VELOCITY(FEET/SEC.) = 11.38

LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12404.00 = 6725.66 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12404.00 TO NODE 12405.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1462.30 DOWNSTREAM(FEET) = 1308.28  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1925.25 CHANNEL SLOPE = 0.0800  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.13

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.996

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	241.71	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 571.73

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.46

AVERAGE FLOW DEPTH(FEET) = 3.09 TRAVEL TIME(MIN.) = 2.80

Tc(MIN.) = 26.20

SUBAREA AREA(ACRES) = 241.71 SUBAREA RUNOFF(CFS) = 368.96

EFFECTIVE AREA(ACRES) = 474.81 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 474.8 PEAK FLOW RATE(CFS) = 724.78

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.48

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.48 FLOW VELOCITY(FEET/SEC.) = 12.26

LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12405.00 = 8650.91 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12405.00 TO NODE 12406.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1308.28 DOWNSTREAM(FEET) = 1154.02  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1923.41 CHANNEL SLOPE = 0.0802  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.91

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.889

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	238.96	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 895.73  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.00  
 AVERAGE FLOW DEPTH(FEET) = 3.88 TRAVEL TIME(MIN.) = 2.47  
 Tc(MIN.) = 28.67  
 SUBAREA AREA(ACRES) = 238.96 SUBAREA RUNOFF(CFS) = 341.85  
 EFFECTIVE AREA(ACRES) = 713.77 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 713.8 PEAK FLOW RATE(CFS) = 1021.09  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.15

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.15 FLOW VELOCITY(FEET/SEC.) = 13.46  
 LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12406.00 = 10574.32 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12406.00 TO NODE 12420.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1154.02 DOWNSTREAM(FEET) = 1073.11  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1607.69 CHANNEL SLOPE = 0.0503  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.75  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.806

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	58.02	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1060.42  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.45  
 AVERAGE FLOW DEPTH(FEET) = 4.75 TRAVEL TIME(MIN.) = 2.34  
 Tc(MIN.) = 31.01

SUBAREA AREA(ACRES) = 58.02 SUBAREA RUNOFF(CFS) = 78.66  
 EFFECTIVE AREA(ACRES) = 771.79 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 771.8 PEAK FLOW RATE(CFS) = 1046.31  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.72

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.72 FLOW VELOCITY(FEET/SEC.) = 11.41  
 LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12420.00 = 12182.01 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12406.00 TO NODE 12420.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 31.01  
 RAINFALL INTENSITY(INCH/HR) = 1.81  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 771.79  
 TOTAL STREAM AREA(ACRES) = 771.79  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 1046.31

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12410.00 TO NODE 12411.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 966.15  
 ELEVATION DATA: UPSTREAM(FEET) = 2215.42 DOWNSTREAM(FEET) = 1909.05

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.886  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.007  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	8.99	0.30	1.000	0	13.89

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 21.90  
 TOTAL AREA(ACRES) = 8.99 PEAK FLOW RATE(CFS) = 21.90

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12411.00 TO NODE 12412.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1909.05 DOWNSTREAM(FEET) = 1794.38  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 943.59 CHANNEL SLOPE = 0.1215  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.66  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.678

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.56	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 41.82  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.83  
 AVERAGE FLOW DEPTH(FEET) = 0.64 TRAVEL TIME(MIN.) = 2.70  
 Tc(MIN.) = 16.58

SUBAREA AREA(ACRES) = 18.56 SUBAREA RUNOFF(CFS) = 39.73  
 EFFECTIVE AREA(ACRES) = 27.55 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 27.5 PEAK FLOW RATE(CFS) = 58.97

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.78

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.78 FLOW VELOCITY (FEET/SEC.) = 6.58  
LONGEST FLOWPATH FROM NODE 12410.00 TO NODE 12412.00 = 1909.74 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12412.00 TO NODE 12413.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1794.38 DOWNSTREAM (FEET) = 1649.76  
CHANNEL LENGTH THRU SUBAREA (FEET) = 926.82 CHANNEL SLOPE = 0.1560  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.84  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.488

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	16.09	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 74.83  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.75  
AVERAGE FLOW DEPTH (FEET) = 0.83 TRAVEL TIME (MIN.) = 1.99  
Tc (MIN.) = 18.58  
SUBAREA AREA (ACRES) = 16.09 SUBAREA RUNOFF (CFS) = 31.69  
EFFECTIVE AREA (ACRES) = 43.64 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 43.6 PEAK FLOW RATE (CFS) = 85.96  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 0.90

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.90 FLOW VELOCITY (FEET/SEC.) = 8.12  
LONGEST FLOWPATH FROM NODE 12410.00 TO NODE 12413.00 = 2836.56 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12413.00 TO NODE 12414.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1649.76 DOWNSTREAM (FEET) = 1365.78  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1906.16 CHANNEL SLOPE = 0.1490  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.30  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.238

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	75.14	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 151.60  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.59  
AVERAGE FLOW DEPTH (FEET) = 1.26 TRAVEL TIME (MIN.) = 3.31  
Tc (MIN.) = 21.89  
SUBAREA AREA (ACRES) = 75.14 SUBAREA RUNOFF (CFS) = 131.05  
EFFECTIVE AREA (ACRES) = 118.78 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 118.8 PEAK FLOW RATE (CFS) = 207.16  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 1.50

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.50 FLOW VELOCITY (FEET/SEC.) = 10.62  
LONGEST FLOWPATH FROM NODE 12410.00 TO NODE 12414.00 = 4742.72 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12414.00 TO NODE 12420.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1365.78 DOWNSTREAM (FEET) = 1073.11  
CHANNEL LENGTH THRU SUBAREA (FEET) = 3038.90 CHANNEL SLOPE = 0.0963  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.22  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.972

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	151.43	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 321.33  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.41  
AVERAGE FLOW DEPTH (FEET) = 2.16 TRAVEL TIME (MIN.) = 4.86  
Tc (MIN.) = 26.75  
SUBAREA AREA (ACRES) = 151.43 SUBAREA RUNOFF (CFS) = 227.92  
EFFECTIVE AREA (ACRES) = 270.21 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 270.2 PEAK FLOW RATE (CFS) = 406.70  
GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 2.45

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 2.45 FLOW VELOCITY (FEET/SEC.) = 11.13  
LONGEST FLOWPATH FROM NODE 12410.00 TO NODE 12420.00 = 7781.62 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12414.00 TO NODE 12420.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION (MIN.) = 26.75  
 RAINFALL INTENSITY (INCH/HR) = 1.97  
 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA (ACRES) = 270.21  
 TOTAL STREAM AREA (ACRES) = 270.21  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 406.70

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1046.31	31.01	1.806	0.30 ( 0.30)	1.00	771.8	12400.00
2	406.70	26.75	1.972	0.30 ( 0.30)	1.00	270.2	12410.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1408.87	26.75	1.972	0.30 ( 0.30)	1.00	936.1	12410.00
2	1412.63	31.01	1.806	0.30 ( 0.30)	1.00	1042.0	12400.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE (CFS) = 1412.63 Tc (MIN.) = 31.01  
 EFFECTIVE AREA (ACRES) = 1042.00 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 1042.0  
 LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12420.00 = 12182.01 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12420.00 TO NODE 12421.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 1073.11 DOWNSTREAM (FEET) = 1005.32  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2235.12 CHANNEL SLOPE = 0.0303  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.47  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.716  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 218.57 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1551.91  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.51  
 AVERAGE FLOW DEPTH (FEET) = 6.45 TRAVEL TIME (MIN.) = 3.55  
 Tc (MIN.) = 34.55  
 SUBAREA AREA (ACRES) = 218.57 SUBAREA RUNOFF (CFS) = 278.53  
 EFFECTIVE AREA (ACRES) = 1260.57 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 1260.6 PEAK FLOW RATE (CFS) = 1606.38  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.56  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 6.56 FLOW VELOCITY (FEET/SEC.) = 10.60  
 LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12421.00 = 14417.13 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12421.00 TO NODE 12422.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 1005.32 DOWNSTREAM (FEET) = 879.13  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2800.31 CHANNEL SLOPE = 0.0451  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.23  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.621  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 241.55 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1750.00  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.55  
 AVERAGE FLOW DEPTH (FEET) = 6.22 TRAVEL TIME (MIN.) = 3.72  
 Tc (MIN.) = 38.27  
 SUBAREA AREA (ACRES) = 241.55 SUBAREA RUNOFF (CFS) = 287.20  
 EFFECTIVE AREA (ACRES) = 1502.12 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 1502.1 PEAK FLOW RATE (CFS) = 1786.03  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.28

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 6.28 FLOW VELOCITY (FEET/SEC.) = 12.62  
 LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12422.00 = 17217.44 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1796.34	34.02	1.730	0.30 ( 0.30)	1.00	1396.2	12410.00
2	1786.03	38.27	1.621	0.30 ( 0.30)	1.00	1502.1	12400.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 1796.34 Tc (MIN.) = 34.02  
 AREA-AVERAGED Fm (INCH/HR) = 0.30 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA (ACRES) = 1396.17

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12422.00 TO NODE 12423.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<



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=====
ELEVATION DATA: UPSTREAM(FEET) = 879.13 DOWNSTREAM(FEET) = 815.17
CHANNEL LENGTH THRU SUBAREA(FEET) = 1918.90 CHANNEL SLOPE = 0.0333
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.93
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.658
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/   SCS SOIL  AREA      Fp      Ap      SCS
    LAND USE          GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED         -      151.63   0.30   1.000   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1889.03
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.44
AVERAGE FLOW DEPTH(FEET) = 6.92 TRAVEL TIME(MIN.) = 2.79
Tc(MIN.) = 36.81
SUBAREA AREA(ACRES) = 151.63 SUBAREA RUNOFF(CFS) = 185.36
EFFECTIVE AREA(ACRES) = 1547.80 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 1653.8 PEAK FLOW RATE(CFS) = 1892.16
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.92

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 6.92 FLOW VELOCITY(FEET/SEC.) = 11.46
LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12423.00 = 19136.34 FEET.

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** PEAK FLOW RATE TABLE **
STREAM      Q      Tc  Intensity  Fp(Fm)    Ap    Ae    HEADWATER
NUMBER     (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1         1892.16 36.81  1.658 0.30( 0.30) 1.00 1547.8 12410.00
2         1868.15 41.07  1.555 0.30( 0.30) 1.00 1653.8 12400.00
NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 1892.16 Tc(MIN.) = 36.81
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 1547.80

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*****
FLOW PROCESS FROM NODE 12423.00 TO NODE 12424.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 815.17 DOWNSTREAM(FEET) = 696.54
CHANNEL LENGTH THRU SUBAREA(FEET) = 2870.82 CHANNEL SLOPE = 0.0413
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.70
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.564
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/   SCS SOIL  AREA      Fp      Ap      SCS
    LAND USE          GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED         -      122.40   0.30   1.000   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1961.79

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TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.53
AVERAGE FLOW DEPTH(FEET) = 6.70 TRAVEL TIME(MIN.) = 3.82
Tc(MIN.) = 40.63
SUBAREA AREA(ACRES) = 122.40 SUBAREA RUNOFF(CFS) = 139.26
EFFECTIVE AREA(ACRES) = 1670.20 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 1776.2 PEAK FLOW RATE(CFS) = 1900.23
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.60

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 6.60 FLOW VELOCITY(FEET/SEC.) = 12.42
LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12424.00 = 22007.16 FEET.

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** PEAK FLOW RATE TABLE **
STREAM      Q      Tc  Intensity  Fp(Fm)    Ap    Ae    HEADWATER
NUMBER     (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1         1900.23 40.63  1.564 0.30( 0.30) 1.00 1670.2 12410.00
2         1881.35 44.91  1.477 0.30( 0.30) 1.00 1776.2 12400.00
NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 1900.23 Tc(MIN.) = 40.63
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 1670.20

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*****
FLOW PROCESS FROM NODE 12424.00 TO NODE 12425.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 696.54 DOWNSTREAM(FEET) = 572.29
CHANNEL LENGTH THRU SUBAREA(FEET) = 3680.45 CHANNEL SLOPE = 0.0338
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 7.01
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.456
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/   SCS SOIL  AREA      Fp      Ap      SCS
    LAND USE          GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED         -      96.54   0.30   1.000   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1950.46
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.59
AVERAGE FLOW DEPTH(FEET) = 7.01 TRAVEL TIME(MIN.) = 5.29
Tc(MIN.) = 45.93
SUBAREA AREA(ACRES) = 96.54 SUBAREA RUNOFF(CFS) = 100.46
EFFECTIVE AREA(ACRES) = 1766.74 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 1872.7 PEAK FLOW RATE(CFS) = 1900.23
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 6.92

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 6.92 FLOW VELOCITY(FEET/SEC.) = 11.53

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LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12425.00 = 25687.61 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1900.23	45.93	1.456	0.30 ( 0.30)	1.00	1766.7	12410.00
2	1881.35	50.22	1.370	0.30 ( 0.30)	1.00	1872.7	12400.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1900.23 Tc(MIN.) = 45.93  
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 1766.74

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1872.7 TC(MIN.) = 45.93  
EFFECTIVE AREA(ACRES) = 1766.74 AREA-AVERAGED Fm(INCH/HR)= 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.000  
PEAK FLOW RATE(CFS) = 1900.23

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1900.23	45.93	1.456	0.30 ( 0.30)	1.00	1766.7	12410.00
2	1881.35	50.22	1.370	0.30 ( 0.30)	1.00	1872.7	12400.00

=====

END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

Michael Baker International  
5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

-----  
FILE NAME: S25.DAT  
TIME/DATE OF STUDY: 08:13 07/16/2018  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.144
- 2) 10.00; 3.922
- 3) 15.00; 3.019
- 4) 20.00; 2.473
- 5) 25.00; 2.135
- 6) 30.00; 1.906
- 7) 40.00; 1.649
- 8) 50.00; 1.422
- 9) 60.00; 1.325
- 10) 90.00; 1.125
- 11) 120.00; 0.989
- 12) 180.00; 0.832
- 13) 360.00; 0.622
- 14) 1440.00; 0.274

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12500.00 TO NODE 12501.00 IS CODE = 21  
-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 927.04  
ELEVATION DATA: UPSTREAM(FEET) = 1638.22 DOWNSTREAM(FEET) = 1356.00

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.770  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.241

SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCSSOIL AREA Fp Ap SCSS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"OPEN BRUSH" - 8.89 0.30 1.000 0 13.77  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 23.53  
TOTAL AREA(ACRES) = 8.89 PEAK FLOW RATE(CFS) = 23.53

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12501.00 TO NODE 12502.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1356.00 DOWNSTREAM(FEET) = 1203.37  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1004.73 CHANNEL SLOPE = 0.1519  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.70  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.883

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCSSOIL AREA Fp Ap SCSS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 24.30 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 51.84  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.78  
AVERAGE FLOW DEPTH(FEET) = 0.67 TRAVEL TIME(MIN.) = 2.47  
Tc(MIN.) = 16.24  
SUBAREA AREA(ACRES) = 24.30 SUBAREA RUNOFF(CFS) = 56.50  
EFFECTIVE AREA(ACRES) = 33.19 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 33.2 PEAK FLOW RATE(CFS) = 77.16  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.85

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.85 FLOW VELOCITY(FEET/SEC.) = 7.76  
LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12502.00 = 1931.77 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12502.00 TO NODE 12503.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1203.37 DOWNSTREAM(FEET) = 987.23  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1884.62 CHANNEL SLOPE = 0.1147  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.51  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.506

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	90.42	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 167.29

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.09

AVERAGE FLOW DEPTH(FEET) = 1.43 TRAVEL TIME(MIN.) = 3.46

Tc(MIN.) = 19.70

SUBAREA AREA(ACRES) = 90.42 SUBAREA RUNOFF(CFS) = 179.53

EFFECTIVE AREA(ACRES) = 123.61 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 123.6 PEAK FLOW RATE(CFS) = 245.43

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.77

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.77 FLOW VELOCITY(FEET/SEC.) = 10.21

LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12503.00 = 3816.39 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12503.00 TO NODE 12504.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 987.23 DOWNSTREAM(FEET) = 870.07  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1478.57 CHANNEL SLOPE = 0.0792  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.31

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.322

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	84.07	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 321.95

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.71

AVERAGE FLOW DEPTH(FEET) = 2.28 TRAVEL TIME(MIN.) = 2.54

Tc(MIN.) = 22.24

SUBAREA AREA(ACRES) = 84.07 SUBAREA RUNOFF(CFS) = 152.98

EFFECTIVE AREA(ACRES) = 207.68 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 207.7 PEAK FLOW RATE(CFS) = 377.90

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.48

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.48 FLOW VELOCITY(FEET/SEC.) = 10.16

LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12504.00 = 5294.96 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12504.00 TO NODE 12505.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 870.07 DOWNSTREAM(FEET) = 729.02  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1915.52 CHANNEL SLOPE = 0.0736  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.78

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.120

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	79.84	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 443.32

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.36

AVERAGE FLOW DEPTH(FEET) = 2.76 TRAVEL TIME(MIN.) = 3.08

Tc(MIN.) = 25.32

SUBAREA AREA(ACRES) = 79.84 SUBAREA RUNOFF(CFS) = 130.79

EFFECTIVE AREA(ACRES) = 287.52 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 287.5 PEAK FLOW RATE(CFS) = 471.02

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.85

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.85 FLOW VELOCITY(FEET/SEC.) = 10.53

LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12505.00 = 7210.48 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12505.00 TO NODE 12520.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 729.02 DOWNSTREAM(FEET) = 549.92  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2961.35 CHANNEL SLOPE = 0.0605  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.21

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.901

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	78.77	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 527.78  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 10.15  
 AVERAGE FLOW DEPTH( FEET) = 3.18 TRAVEL TIME(MIN.) = 4.86  
 Tc(MIN.) = 30.18  
 SUBAREA AREA(ACRES) = 78.77 SUBAREA RUNOFF(CFS) = 113.50  
 EFFECTIVE AREA(ACRES) = 366.29 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 366.3 PEAK FLOW RATE(CFS) = 527.80  
 GIVEN CHANNEL BASE( FEET) = 10.00 CHANNEL FREEBOARD( FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT( FEET) = 3.18

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH( FEET) = 3.18 FLOW VELOCITY( FEET/SEC.) = 10.15  
 LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12520.00 = 10171.83 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12505.00 TO NODE 12520.00 IS CODE = 10

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

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12342.00 TO NODE 12425.00 IS CODE = 15.1

-----  
 >>>>DEFINE MEMORY BANK # 2 <<<<<  
 =====

PEAK FLOWRATE TABLE FILE NAME: S23.DNA  
 MEMORY BANK # 2 DEFINED AS FOLLOWS:  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6206.18	41.67	0.30( 0.29)	0.97	4459.8	12300.00
2	6316.16	43.11	0.30( 0.29)	0.97	4682.1	12330.00
3	7075.33	55.07	0.30( 0.29)	0.97	6399.6	12211.00
4	7279.61	59.17	0.30( 0.29)	0.97	6986.1	12201.00
5	7374.25	63.10	0.30( 0.29)	0.97	7454.3	12111.00
6	7389.34	65.55	0.30( 0.29)	0.97	7755.5	12231.00
7	7379.15	68.30	0.30( 0.29)	0.97	8059.8	12101.10
8	7370.30	69.12	0.30( 0.29)	0.97	8140.9	12261.00
9	7028.99	79.53	0.30( 0.29)	0.97	8889.6	12010.00
10	6490.72	87.30	0.30( 0.29)	0.97	9014.4	12000.00

 TOTAL AREA(ACRES) = 9014.4

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12424.00 TO NODE 12425.00 IS CODE = 15.1

-----  
 >>>>DEFINE MEMORY BANK # 3 <<<<<  
 =====

PEAK FLOWRATE TABLE FILE NAME: S24.DNA  
 MEMORY BANK # 3 DEFINED AS FOLLOWS:  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1900.23	45.93	0.30( 0.30)	1.00	1766.7	12410.00
2	1881.35	50.22	0.30( 0.30)	1.00	1872.7	12400.00

 TOTAL AREA(ACRES) = 1872.7

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12424.00 TO NODE 12425.00 IS CODE = 14.0

-----  
 >>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
 =====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1900.23	45.93	0.30( 0.30)	1.00	1766.7	12410.00
2	1881.35	50.22	0.30( 0.30)	1.00	1872.7	12400.00

 TOTAL AREA(ACRES) = 1872.7

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12342.00 TO NODE 12425.00 IS CODE = 11

-----  
 >>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<  
 =====

\*\* MAIN STREAM CONFLUENCE DATA \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1900.23	45.93	1.515	0.30( 0.30)	1.00	1766.7	12410.00
2	1881.35	50.22	1.420	0.30( 0.30)	1.00	1872.7	12400.00

 LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12425.00 = 25687.61 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6206.18	41.67	1.611	0.30( 0.29)	0.97	4459.8	12300.00
2	6316.16	43.11	1.578	0.30( 0.29)	0.97	4682.1	12330.00
3	7075.33	55.07	1.373	0.30( 0.29)	0.97	6399.6	12211.00
4	7279.61	59.17	1.333	0.30( 0.29)	0.97	6986.1	12201.00
5	7374.25	63.10	1.305	0.30( 0.29)	0.97	7454.3	12111.00
6	7389.34	65.55	1.288	0.30( 0.29)	0.97	7755.5	12231.00
7	7379.15	68.30	1.270	0.30( 0.29)	0.97	8059.8	12101.10
8	7370.30	69.12	1.264	0.30( 0.29)	0.97	8140.9	12261.00
9	7028.99	79.53	1.195	0.30( 0.29)	0.97	8889.6	12010.00
10	6490.72	87.30	1.143	0.30( 0.29)	0.97	9014.4	12000.00

 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12425.00 = 56500.46 FEET.

\*\* PEAK FLOW RATE TABLE \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8067.39	41.67	1.611	0.30( 0.29)	0.98	6063.0	12300.00
2	8193.72	43.11	1.578	0.30( 0.29)	0.98	6340.7	12330.00
3	8394.91	45.93	1.515	0.30( 0.29)	0.98	6852.7	12410.00
4	8648.43	50.22	1.420	0.30( 0.29)	0.98	7574.9	12400.00
5	8877.69	55.07	1.373	0.30( 0.29)	0.98	8272.3	12211.00
6	9015.24	59.17	1.333	0.30( 0.29)	0.98	8858.8	12201.00
7	9061.59	63.10	1.305	0.30( 0.29)	0.97	9327.0	12111.00
8	9049.24	65.55	1.288	0.30( 0.29)	0.97	9628.2	12231.00
9	9008.17	68.30	1.270	0.30( 0.29)	0.97	9932.5	12101.10
10	8990.16	69.12	1.264	0.30( 0.29)	0.97	10013.6	12261.00
11	8531.90	79.53	1.195	0.30( 0.29)	0.98	10762.3	12010.00
12	7906.51	87.30	1.143	0.30( 0.29)	0.98	10887.1	12000.00

 TOTAL AREA(ACRES) = 10887.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 9061.59 Tc(MIN.) = 63.105
EFFECTIVE AREA(ACRES) = 9327.03 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 10887.1
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12425.00 = 56500.46 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 12425.00 TO NODE 12520.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 572.29 DOWNSTREAM(FEET) = 549.92
CHANNEL LENGTH THRU SUBAREA(FEET) = 1724.25 CHANNEL SLOPE = 0.0130
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.50
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.287
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 117.96 0.30 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9113.97
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.66
AVERAGE FLOW DEPTH(FEET) = 10.49 TRAVEL TIME(MIN.) = 2.70
Tc(MIN.) = 65.80
SUBAREA AREA(ACRES) = 117.96 SUBAREA RUNOFF(CFS) = 104.74
EFFECTIVE AREA(ACRES) = 9444.99 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 11005.0 PEAK FLOW RATE(CFS) = 9061.59
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.46
END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 10.46 FLOW VELOCITY(FEET/SEC.) = 10.64
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12520.00 = 58224.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp (Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 12 rows of data.

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 9061.59 Tc(MIN.) = 65.80
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 9444.99

\*\*\*\*\*
FLOW PROCESS FROM NODE 12505.00 TO NODE 12520.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp (Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 12 rows of data.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp (Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 1 row of data.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp (Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 13 rows of data.

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 9386.85 Tc(MIN.) = 65.801
EFFECTIVE AREA(ACRES) = 9811.28 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 11371.3
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12520.00 = 58224.71 FEET.

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*****
FLOW PROCESS FROM NODE 12520.00 TO NODE 12521.00 IS CODE = 56
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 549.92 DOWNSTREAM(FEET) = 525.43
CHANNEL LENGTH THRU SUBAREA(FEET) = 1934.41 CHANNEL SLOPE = 0.0127
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 10.75
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.266
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 85.91 0.30 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9424.21
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.67
AVERAGE FLOW DEPTH(FEET) = 10.75 TRAVEL TIME(MIN.) = 3.02
Tc(MIN.) = 68.82
SUBAREA AREA(ACRES) = 85.91 SUBAREA RUNOFF(CFS) = 74.72
EFFECTIVE AREA(ACRES) = 9897.19 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 11457.2 PEAK FLOW RATE(CFS) = 9386.85
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 10.72

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 10.72 FLOW VELOCITY(FEET/SEC.) = 10.65
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12521.00 = 60159.12 FEET.

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\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7546.62	33.39	1.819	0.30( 0.29)	0.98	4648.3	12500.00
2	8478.81	47.56	1.477	0.30( 0.29)	0.98	6633.1	12300.00
3	8594.46	48.98	1.445	0.30( 0.29)	0.98	6910.9	12330.00
4	8774.76	51.76	1.405	0.30( 0.29)	0.98	7422.9	12410.00
5	9008.99	56.00	1.364	0.30( 0.29)	0.98	8145.1	12400.00
6	9222.81	60.82	1.320	0.30( 0.29)	0.98	8842.5	12211.00
7	9349.15	64.90	1.293	0.30( 0.29)	0.98	9429.0	12201.00
8	9386.85	68.82	1.266	0.30( 0.29)	0.98	9897.2	12111.00
9	9369.11	71.27	1.250	0.30( 0.29)	0.98	10198.3	12231.00
10	9321.96	74.03	1.232	0.30( 0.29)	0.97	10502.7	12101.10
11	9302.16	74.85	1.226	0.30( 0.29)	0.97	10583.7	12261.00
12	8944.23	85.34	1.156	0.30( 0.29)	0.98	11332.5	12010.00
13	8509.86	93.20	1.110	0.30( 0.29)	0.98	11457.2	12000.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 9386.85 Tc(MIN.) = 68.82  
 AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 9897.19

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*****
FLOW PROCESS FROM NODE 12521.00 TO NODE 12522.00 IS CODE = 56

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 525.43 DOWNSTREAM(FEET) = 490.87
CHANNEL LENGTH THRU SUBAREA(FEET) = 3335.01 CHANNEL SLOPE = 0.0104
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 11.45
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.229
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 539.82 0.30 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9612.58
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.98
AVERAGE FLOW DEPTH(FEET) = 11.43 TRAVEL TIME(MIN.) = 5.57
Tc(MIN.) = 74.39
SUBAREA AREA(ACRES) = 539.82 SUBAREA RUNOFF(CFS) = 451.44
EFFECTIVE AREA(ACRES) = 10437.01 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 11997.0 PEAK FLOW RATE(CFS) = 9386.85
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 11.29

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 11.29 FLOW VELOCITY(FEET/SEC.) = 9.91
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12522.00 = 63494.13 FEET.

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\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7546.62	39.28	1.668	0.30( 0.30)	0.98	5188.1	12500.00
2	8478.81	53.28	1.390	0.30( 0.30)	0.98	7172.9	12300.00
3	8594.46	54.68	1.377	0.30( 0.29)	0.98	7450.7	12330.00
4	8774.76	57.42	1.350	0.30( 0.29)	0.98	7962.7	12410.00
5	9008.99	61.63	1.314	0.30( 0.29)	0.98	8684.9	12400.00
6	9222.81	66.41	1.282	0.30( 0.29)	0.98	9382.3	12211.00
7	9349.15	70.47	1.255	0.30( 0.29)	0.98	9968.8	12201.00
8	9386.85	74.39	1.229	0.30( 0.29)	0.98	10437.0	12111.00
9	9369.11	76.84	1.213	0.30( 0.29)	0.98	10738.1	12231.00
10	9321.96	79.61	1.194	0.30( 0.29)	0.98	11042.5	12101.10
11	9302.16	80.43	1.189	0.30( 0.29)	0.98	11123.5	12261.00
12	8944.23	90.99	1.120	0.30( 0.29)	0.98	11872.3	12010.00
13	8542.67	98.93	1.084	0.30( 0.29)	0.98	11997.0	12000.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 9386.85 Tc(MIN.) = 74.39  
 AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 10437.01

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*****
FLOW PROCESS FROM NODE 12522.00 TO NODE 12523.00 IS CODE = 56

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

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>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 490.87 DOWNSTREAM(FEET) = 467.63
CHANNEL LENGTH THRU SUBAREA(FEET) = 1961.26 CHANNEL SLOPE = 0.0118
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.99
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.208
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 321.58 0.30 1.000 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9518.29
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.45
AVERAGE FLOW DEPTH(FEET) = 10.98 TRAVEL TIME(MIN.) = 3.13
Tc(MIN.) = 77.52
SUBAREA AREA(ACRES) = 321.58 SUBAREA RUNOFF(CFS) = 262.88
EFFECTIVE AREA(ACRES) = 10758.59 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 12318.6 PEAK FLOW RATE(CFS) = 9386.85
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.91

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 10.91 FLOW VELOCITY(FEET/SEC.) = 10.41
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12523.00 = 65455.39 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 1-13.

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 9386.85 Tc(MIN.) = 77.52
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 10758.59

\*\*\*\*\*
FLOW PROCESS FROM NODE 12523.00 TO NODE 12524.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 467.63 DOWNSTREAM(FEET) = 436.35
CHANNEL LENGTH THRU SUBAREA(FEET) = 2841.85 CHANNEL SLOPE = 0.0110
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.20
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.177
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 298.62 0.30 1.000 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9504.72
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.17
AVERAGE FLOW DEPTH(FEET) = 11.19 TRAVEL TIME(MIN.) = 4.66
Tc(MIN.) = 82.18
SUBAREA AREA(ACRES) = 298.62 SUBAREA RUNOFF(CFS) = 235.74
EFFECTIVE AREA(ACRES) = 11057.21 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 12617.2 PEAK FLOW RATE(CFS) = 9386.85
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.11

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 11.11 FLOW VELOCITY(FEET/SEC.) = 10.14
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12524.00 = 68297.24 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 1-13.

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 9386.85 Tc(MIN.) = 82.18
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 11057.21

\*\*\*\*\*
FLOW PROCESS FROM NODE 12524.00 TO NODE 12525.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 436.35 DOWNSTREAM(FEET) = 415.23
CHANNEL LENGTH THRU SUBAREA(FEET) = 2812.14 CHANNEL SLOPE = 0.0075



GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 12.33  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.142  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 251.20 0.30 0.997 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.997  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 9482.10  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.85  
 AVERAGE FLOW DEPTH (FEET) = 12.32 TRAVEL TIME (MIN.) = 5.29  
 Tc (MIN.) = 87.47  
 SUBAREA AREA (ACRES) = 251.20 SUBAREA RUNOFF (CFS) = 190.51  
 EFFECTIVE AREA (ACRES) = 11308.41 AREA-AVERAGED Fm (INCH/HR) = 0.29  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98  
 TOTAL AREA (ACRES) = 12868.4 PEAK FLOW RATE (CFS) = 9386.85  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 12.26

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 12.26 FLOW VELOCITY (FEET/SEC.) = 8.83  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12525.00 = 71109.38 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7546.62	53.16	1.392	0.30 ( 0.30)	0.99	6059.5	12500.00
2	8478.81	66.73	1.280	0.30 ( 0.30)	0.99	8044.3	12300.00
3	8594.46	68.08	1.271	0.30 ( 0.30)	0.98	8322.1	12330.00
4	8774.76	70.75	1.254	0.30 ( 0.30)	0.98	8834.1	12410.00
5	9008.99	74.85	1.226	0.30 ( 0.29)	0.98	9556.3	12400.00
6	9222.81	79.55	1.195	0.30 ( 0.29)	0.98	10253.7	12211.00
7	9349.15	83.57	1.168	0.30 ( 0.29)	0.98	10840.2	12201.00
8	9386.85	87.47	1.142	0.30 ( 0.29)	0.98	11308.4	12111.00
9	9369.11	89.93	1.125	0.30 ( 0.29)	0.98	11609.5	12231.00
10	9321.96	92.71	1.113	0.30 ( 0.29)	0.98	11913.9	12101.10
11	9302.16	93.55	1.109	0.30 ( 0.29)	0.98	11994.9	12261.00
12	8944.23	104.25	1.060	0.30 ( 0.29)	0.98	12743.7	12010.00
13	8608.51	112.34	1.024	0.30 ( 0.29)	0.98	12868.4	12000.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 9386.85 Tc (MIN.) = 87.47  
 AREA-AVERAGED Fm (INCH/HR) = 0.29 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA (ACRES) = 11308.41

\*\*\*\*\*

FLOW PROCESS FROM NODE 12525.00 TO NODE 12526.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 415.23 DOWNSTREAM (FEET) = 380.28  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2934.09 CHANNEL SLOPE = 0.0119  
 GIVEN CHANNEL BASE (FEET) = 100.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 7.86  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.112  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 247.71 0.30 0.987 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.987  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 9477.82  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.18  
 AVERAGE FLOW DEPTH (FEET) = 7.85 TRAVEL TIME (MIN.) = 5.32  
 Tc (MIN.) = 92.80  
 SUBAREA AREA (ACRES) = 247.71 SUBAREA RUNOFF (CFS) = 181.95  
 EFFECTIVE AREA (ACRES) = 11556.12 AREA-AVERAGED Fm (INCH/HR) = 0.29  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98  
 TOTAL AREA (ACRES) = 13116.2 PEAK FLOW RATE (CFS) = 9386.85  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 100.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 7.81

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 7.81 FLOW VELOCITY (FEET/SEC.) = 9.16  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12526.00 = 74043.48 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7546.62	58.85	1.336	0.30 ( 0.30)	0.99	6307.2	12500.00
2	8478.81	72.22	1.244	0.30 ( 0.30)	0.99	8292.1	12300.00
3	8594.46	73.55	1.235	0.30 ( 0.30)	0.98	8569.8	12330.00
4	8774.76	76.18	1.217	0.30 ( 0.30)	0.98	9081.8	12410.00
5	9008.99	80.24	1.190	0.30 ( 0.29)	0.98	9804.0	12400.00
6	9222.81	84.91	1.159	0.30 ( 0.29)	0.98	10501.4	12211.00
7	9349.15	88.90	1.132	0.30 ( 0.29)	0.98	11087.9	12201.00
8	9386.85	92.80	1.112	0.30 ( 0.29)	0.98	11556.1	12111.00
9	9369.11	95.26	1.101	0.30 ( 0.29)	0.98	11857.2	12231.00
10	9321.96	98.05	1.088	0.30 ( 0.29)	0.98	12161.6	12101.10
11	9302.16	98.89	1.085	0.30 ( 0.29)	0.98	12242.6	12261.00
12	8944.23	109.66	1.036	0.30 ( 0.29)	0.98	12991.4	12010.00
13	8608.51	117.81	0.999	0.30 ( 0.29)	0.98	13116.2	12000.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 9386.85 Tc (MIN.) = 92.80  
 AREA-AVERAGED Fm (INCH/HR) = 0.29 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA (ACRES) = 11556.12

\*\*\*\*\*

FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 380.28 DOWNSTREAM (FEET) = 347.47  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 3113.51 CHANNEL SLOPE = 0.0105  
 GIVEN CHANNEL BASE (FEET) = 100.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 8.11  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.085

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 120.94 0.30 0.974 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.974  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9430.02  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.79  
 AVERAGE FLOW DEPTH(FEET) = 8.10 TRAVEL TIME(MIN.) = 5.90  
 Tc(MIN.) = 98.70  
 SUBAREA AREA(ACRES) = 120.94 SUBAREA RUNOFF(CFS) = 86.35  
 EFFECTIVE AREA(ACRES) = 11677.06 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98  
 TOTAL AREA(ACRES) = 13237.1 PEAK FLOW RATE(CFS) = 9386.85  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 8.08

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 8.08 FLOW VELOCITY(FEET/SEC.) = 8.78  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12527.00 = 77156.98 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7546.62	65.16	1.291	0.30( 0.30)	0.99	6428.1	12500.00
2	8478.81	78.31	1.203	0.30( 0.30)	0.99	8413.0	12300.00
3	8594.46	79.61	1.194	0.30( 0.30)	0.98	8690.7	12330.00
4	8774.76	82.21	1.177	0.30( 0.30)	0.98	9202.8	12410.00
5	9008.99	86.22	1.150	0.30( 0.29)	0.98	9925.0	12400.00
6	9222.81	90.84	1.121	0.30( 0.29)	0.98	10622.3	12211.00
7	9349.15	94.81	1.103	0.30( 0.29)	0.98	11208.8	12201.00
8	9386.85	98.70	1.085	0.30( 0.29)	0.98	11677.1	12111.00
9	9369.11	101.16	1.074	0.30( 0.29)	0.98	11978.2	12231.00
10	9321.96	103.97	1.062	0.30( 0.29)	0.98	12282.5	12101.10
11	9302.16	104.81	1.058	0.30( 0.29)	0.98	12363.6	12261.00
12	8944.23	115.65	1.009	0.30( 0.29)	0.98	13112.3	12010.00
13	8608.51	123.88	0.979	0.30( 0.29)	0.98	13237.1	12000.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 9386.85 Tc(MIN.) = 98.70  
 AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 11677.06

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 13237.1 TC(MIN.) = 98.70  
 EFFECTIVE AREA(ACRES) = 11677.06 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.979  
 PEAK FLOW RATE(CFS) = 9386.85

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7546.62	65.16	1.291	0.30( 0.30)	0.99	6428.1	12500.00
2	8478.81	78.31	1.203	0.30( 0.30)	0.99	8413.0	12300.00
3	8594.46	79.61	1.194	0.30( 0.30)	0.98	8690.7	12330.00
4	8774.76	82.21	1.177	0.30( 0.30)	0.98	9202.8	12410.00
5	9008.99	86.22	1.150	0.30( 0.29)	0.98	9925.0	12400.00

6	9222.81	90.84	1.121	0.30( 0.29)	0.98	10622.3	12211.00
7	9349.15	94.81	1.103	0.30( 0.29)	0.98	11208.8	12201.00
8	9386.85	98.70	1.085	0.30( 0.29)	0.98	11677.1	12111.00
9	9369.11	101.16	1.074	0.30( 0.29)	0.98	11978.2	12231.00
10	9321.96	103.97	1.062	0.30( 0.29)	0.98	12282.5	12101.10
11	9302.16	104.81	1.058	0.30( 0.29)	0.98	12363.6	12261.00
12	8944.23	115.65	1.009	0.30( 0.29)	0.98	13112.3	12010.00
13	8608.51	123.88	0.979	0.30( 0.29)	0.98	13237.1	12000.00

=====  
 END OF RATIONAL METHOD ANALYSIS  
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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

Michael Baker International  
5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

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FILE NAME: S26.DAT  
TIME/DATE OF STUDY: 08:13 07/16/2018  
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--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*

NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.099
- 2) 10.00; 3.899
- 3) 15.00; 3.004
- 4) 20.00; 2.464
- 5) 25.00; 2.128
- 6) 30.00; 1.900
- 7) 40.00; 1.644
- 8) 50.00; 1.418
- 9) 60.00; 1.319
- 10) 90.00; 1.119
- 11) 120.00; 0.983
- 12) 180.00; 0.826
- 13) 360.00; 0.616
- 14) 1200.00; 0.271

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO STREET-CROSSFALL (FT)	IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 11929.00 TO NODE 11929.00 IS CODE = 15.1

-----  
>>>>DEFINE MEMORY BANK # 1 <<<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: S19.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25330.83	16.62	0.30 ( 0.30)	0.99	6202.0	40200.00
2	29136.17	30.53	0.30 ( 0.30)	0.99	11484.0	40100.00
3	31428.09	37.20	0.30 ( 0.30)	0.99	13874.9	11831.00
4	32233.26	39.75	0.30 ( 0.30)	0.99	14828.3	11801.00
5	35316.21	49.76	0.30 ( 0.30)	0.99	19123.7	11530.00
6	37730.98	58.67	0.30 ( 0.30)	0.99	24107.5	11910.00
7	39954.48	66.11	0.30 ( 0.30)	0.99	28713.7	11330.00
8	41102.23	72.60	0.30 ( 0.30)	0.99	33144.0	11130.00
9	41075.25	80.17	0.30 ( 0.30)	0.99	37134.3	12330.00
10	41040.71	82.77	0.30 ( 0.30)	0.99	38551.3	12410.00
11	40892.30	86.78	0.30 ( 0.30)	0.99	40477.3	12400.00
12	40433.39	95.38	0.30 ( 0.30)	0.99	43844.7	12201.00
13	40005.67	99.27	0.30 ( 0.30)	0.99	44930.9	12111.00
14	39725.68	101.62	0.30 ( 0.30)	0.99	45571.3	10700.00
15	39402.63	104.54	0.30 ( 0.30)	0.99	46300.3	12101.10
16	38908.56	108.48	0.30 ( 0.30)	0.99	47151.1	10400.00
17	37425.68	116.23	0.30 ( 0.30)	0.99	48463.2	12010.00
18	36149.29	121.90	0.30 ( 0.30)	0.99	48779.7	10210.00
19	35796.61	124.46	0.30 ( 0.30)	0.99	48888.7	12000.00
20	32836.05	147.31	0.30 ( 0.30)	0.99	49511.8	10100.00

TOTAL AREA(ACRES) = 49511.8

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FLOW PROCESS FROM NODE 11929.00 TO NODE 11929.00 IS CODE = 14.0

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

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25330.83	16.62	0.30 ( 0.30)	0.99	6202.0	40200.00
2	29136.17	30.53	0.30 ( 0.30)	0.99	11484.0	40100.00
3	31428.09	37.20	0.30 ( 0.30)	0.99	13874.9	11831.00
4	32233.26	39.75	0.30 ( 0.30)	0.99	14828.3	11801.00
5	35316.21	49.76	0.30 ( 0.30)	0.99	19123.7	11530.00
6	37730.98	58.67	0.30 ( 0.30)	0.99	24107.5	11910.00
7	39954.48	66.11	0.30 ( 0.30)	0.99	28713.7	11330.00
8	41102.23	72.60	0.30 ( 0.30)	0.99	33144.0	11130.00
9	41075.25	80.17	0.30 ( 0.30)	0.99	37134.3	12330.00
10	41040.71	82.77	0.30 ( 0.30)	0.99	38551.3	12410.00
11	40892.30	86.78	0.30 ( 0.30)	0.99	40477.3	12400.00
12	40433.39	95.38	0.30 ( 0.30)	0.99	43844.7	12201.00
13	40005.67	99.27	0.30 ( 0.30)	0.99	44930.9	12111.00
14	39725.68	101.62	0.30 ( 0.30)	0.99	45571.3	10700.00
15	39402.63	104.54	0.30 ( 0.30)	0.99	46300.3	12101.10
16	38908.56	108.48	0.30 ( 0.30)	0.99	47151.1	10400.00
17	37425.68	116.23	0.30 ( 0.30)	0.99	48463.2	12010.00
18	36149.29	121.90	0.30 ( 0.30)	0.99	48779.7	10210.00

19 35796.61 124.46 0.30( 0.30) 0.99 48888.7 12000.00  
20 32836.05 147.31 0.30( 0.30) 0.99 49511.8 10100.00  
TOTAL AREA (ACRES) = 49511.8

\*\*\*\*\*

FLOW PROCESS FROM NODE 11929.00 TO NODE 12601.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 341.63 DOWNSTREAM(FEET) = 325.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1467.93 CHANNEL SLOPE = 0.0113  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.57

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.227

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	14.11	0.30	0.992	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.992

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 41108.13

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 19.74

AVERAGE FLOW DEPTH(FEET) = 8.57 TRAVEL TIME(MIN.) = 1.24

Tc(MIN.) = 73.84

SUBAREA AREA(ACRES) = 14.11 SUBAREA RUNOFF(CFS) = 11.80

EFFECTIVE AREA(ACRES) = 33158.14 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99

TOTAL AREA(ACRES) = 49525.9 PEAK FLOW RATE(CFS) = 41102.23

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.57

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.57 FLOW VELOCITY(FEET/SEC.) = 19.74

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12601.00 = 99868.45 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25330.83	18.07	2.672	0.30( 0.30)	0.99	6216.1	40200.00
2	29136.17	31.92	1.851	0.30( 0.30)	0.99	11498.1	40100.00
3	31428.09	38.55	1.681	0.30( 0.30)	0.99	13889.0	11831.00
4	32233.26	41.09	1.619	0.30( 0.30)	0.99	14842.4	11801.00
5	35316.21	51.07	1.407	0.30( 0.30)	0.99	19137.8	11530.00
6	37730.98	59.94	1.320	0.30( 0.30)	0.99	24121.6	11910.00
7	39954.48	67.36	1.270	0.30( 0.30)	0.99	28727.8	11330.00
8	41102.23	73.84	1.227	0.30( 0.30)	0.99	33158.1	11130.00
9	41075.25	81.41	1.176	0.30( 0.30)	0.99	37148.4	12330.00
10	41040.71	84.01	1.159	0.30( 0.30)	0.99	38565.4	12410.00
11	40892.30	88.03	1.132	0.30( 0.30)	0.99	40491.4	12400.00
12	40433.39	96.62	1.089	0.30( 0.30)	0.99	43858.8	12201.00
13	40005.67	100.52	1.071	0.30( 0.30)	0.99	44945.1	12111.00
14	39725.68	102.87	1.061	0.30( 0.30)	0.99	45585.4	10700.00
15	39402.63	105.79	1.047	0.30( 0.30)	0.99	46314.4	12101.10
16	38908.56	109.74	1.030	0.30( 0.30)	0.99	47165.2	10400.00

17 37425.68 117.51 0.994 0.30( 0.30) 0.99 48477.3 12010.00  
18 36149.29 123.19 0.975 0.30( 0.30) 0.99 48793.8 10210.00  
19 35796.61 125.76 0.968 0.30( 0.30) 0.99 48902.8 12000.00  
20 32836.05 148.64 0.908 0.30( 0.30) 0.99 49525.9 10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 41102.23 Tc(MIN.) = 73.84

AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 33158.14

\*\*\*\*\*

FLOW PROCESS FROM NODE 12601.00 TO NODE 12601.00 IS CODE = 15.1

-----  
>>>>DEFINE MEMORY BANK # 2 <<<<<

-----  
PEAK FLOWRATE TABLE FILE NAME: 0610318Y.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	248.72	16.54	0.30( 0.30)	1.00	108.9	31800.00
2	233.03	19.99	0.30( 0.30)	1.00	119.0	31810.00
TOTAL AREA(ACRES) =		119.0				

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FLOW PROCESS FROM NODE 12601.00 TO NODE 12601.00 IS CODE = 11

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>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25330.83	18.07	2.672	0.30( 0.30)	0.99	6216.1	40200.00
2	29136.17	31.92	1.851	0.30( 0.30)	0.99	11498.1	40100.00
3	31428.09	38.55	1.681	0.30( 0.30)	0.99	13889.0	11831.00
4	32233.26	41.09	1.619	0.30( 0.30)	0.99	14842.4	11801.00
5	35316.21	51.07	1.407	0.30( 0.30)	0.99	19137.8	11530.00
6	37730.98	59.94	1.320	0.30( 0.30)	0.99	24121.6	11910.00
7	39954.48	67.36	1.270	0.30( 0.30)	0.99	28727.8	11330.00
8	41102.23	73.84	1.227	0.30( 0.30)	0.99	33158.1	11130.00
9	41075.25	81.41	1.176	0.30( 0.30)	0.99	37148.4	12330.00
10	41040.71	84.01	1.159	0.30( 0.30)	0.99	38565.4	12410.00
11	40892.30	88.03	1.132	0.30( 0.30)	0.99	40491.4	12400.00
12	40433.39	96.62	1.089	0.30( 0.30)	0.99	43858.8	12201.00
13	40005.67	100.52	1.071	0.30( 0.30)	0.99	44945.1	12111.00
14	39725.68	102.87	1.061	0.30( 0.30)	0.99	45585.4	10700.00
15	39402.63	105.79	1.047	0.30( 0.30)	0.99	46314.4	12101.10
16	38908.56	109.74	1.030	0.30( 0.30)	0.99	47165.2	10400.00
17	37425.68	117.51	0.994	0.30( 0.30)	0.99	48477.3	12010.00
18	36149.29	123.19	0.975	0.30( 0.30)	0.99	48793.8	10210.00
19	35796.61	125.76	0.968	0.30( 0.30)	0.99	48902.8	12000.00
20	32836.05	148.64	0.908	0.30( 0.30)	0.99	49525.9	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12601.00 = 99868.45 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	248.72	16.54	2.838	0.30( 0.30)	1.00	108.9	31800.00
2	233.03	19.99	2.465	0.30( 0.30)	1.00	119.0	31810.00

LONGEST FLOWPATH FROM NODE 31810.00 TO NODE 12601.00 = 4599.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25047.11	16.54	2.838	0.30 ( 0.30)	0.99	5797.3	31800.00
2	25572.57	18.07	2.672	0.30 ( 0.30)	0.99	6329.5	40200.00
3	26090.52	19.99	2.465	0.30 ( 0.30)	0.99	7066.2	31810.00
4	29303.09	31.92	1.851	0.30 ( 0.30)	0.99	11617.1	40100.00
5	31576.74	38.55	1.681	0.30 ( 0.30)	0.99	14008.0	11831.00
6	32375.27	41.09	1.619	0.30 ( 0.30)	0.99	14961.4	11801.00
7	35435.41	51.07	1.407	0.30 ( 0.30)	0.99	19256.8	11530.00
8	37840.72	59.94	1.320	0.30 ( 0.30)	0.99	24240.6	11910.00
9	40058.88	67.36	1.270	0.30 ( 0.30)	0.99	28846.8	11330.00
10	41201.98	73.84	1.227	0.30 ( 0.30)	0.99	33277.2	11130.00
11	41169.56	81.41	1.176	0.30 ( 0.30)	0.99	37267.4	12330.00
12	41133.16	84.01	1.159	0.30 ( 0.30)	0.99	38684.4	12410.00
13	40981.88	88.03	1.132	0.30 ( 0.30)	0.99	40610.5	12400.00
14	40518.31	96.62	1.089	0.30 ( 0.30)	0.99	43977.8	12201.00
15	40088.70	100.52	1.071	0.30 ( 0.30)	0.99	45064.1	12111.00
16	39807.55	102.87	1.061	0.30 ( 0.30)	0.99	45704.4	10700.00
17	39483.08	105.79	1.047	0.30 ( 0.30)	0.99	46433.4	12101.10
18	38987.08	109.74	1.030	0.30 ( 0.30)	0.99	47284.2	10400.00
19	37500.42	117.51	0.994	0.30 ( 0.30)	0.99	48596.3	12010.00
20	36221.91	123.19	0.975	0.30 ( 0.30)	0.99	48912.9	10210.00
21	35868.50	125.76	0.968	0.30 ( 0.30)	0.99	49021.8	12000.00
22	32901.50	148.64	0.908	0.30 ( 0.30)	0.99	49644.9	10100.00

TOTAL AREA (ACRES) = 49644.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 41201.98 Tc (MIN.) = 73.842  
EFFECTIVE AREA (ACRES) = 33277.17 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 49644.9  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12601.00 = 99868.45 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12601.00 TO NODE 12602.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM (FEET) = 325.00 DOWNSTREAM (FEET) = 313.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1377.46 CHANNEL SLOPE = 0.0087  
GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 9.25  
CHANNEL FLOW THRU SUBAREA (CFS) = 41201.98  
FLOW VELOCITY (FEET/SEC.) = 18.09 FLOW DEPTH (FEET) = 9.25  
TRAVEL TIME (MIN.) = 1.27 Tc (MIN.) = 75.11  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12602.00 = 101245.91 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25047.11	18.04	2.676	0.30 ( 0.30)	0.99	5797.3	31800.00
2	25572.57	19.56	2.511	0.30 ( 0.30)	0.99	6329.5	40200.00
3	26090.52	21.47	2.365	0.30 ( 0.30)	0.99	7066.2	31810.00

4	29303.09	33.34	1.814	0.30 ( 0.30)	0.99	11617.1	40100.00
5	31576.74	39.94	1.646	0.30 ( 0.30)	0.99	14008.0	11831.00
6	32375.27	42.47	1.588	0.30 ( 0.30)	0.99	14961.4	11801.00
7	35435.41	52.40	1.394	0.30 ( 0.30)	0.99	19256.8	11530.00
8	37840.72	61.25	1.311	0.30 ( 0.30)	0.99	24240.6	11910.00
9	40058.88	68.64	1.261	0.30 ( 0.30)	0.99	28846.8	11330.00
10	41201.98	75.11	1.218	0.30 ( 0.30)	0.99	33277.2	11130.00
11	41169.56	82.68	1.168	0.30 ( 0.30)	0.99	37267.4	12330.00
12	41133.16	85.28	1.150	0.30 ( 0.30)	0.99	38684.4	12410.00
13	40981.88	89.30	1.124	0.30 ( 0.30)	0.99	40610.5	12400.00
14	40518.31	97.90	1.083	0.30 ( 0.30)	0.99	43977.8	12201.00
15	40088.70	101.80	1.066	0.30 ( 0.30)	0.99	45064.1	12111.00
16	39807.55	104.16	1.055	0.30 ( 0.30)	0.99	45704.4	10700.00
17	39483.08	107.08	1.042	0.30 ( 0.30)	0.99	46433.4	12101.10
18	38987.08	111.03	1.024	0.30 ( 0.30)	0.99	47284.2	10400.00
19	37500.42	118.82	0.988	0.30 ( 0.30)	0.99	48596.3	12010.00
20	36221.91	124.51	0.971	0.30 ( 0.30)	0.99	48912.9	10210.00
21	35868.50	127.09	0.964	0.30 ( 0.30)	0.99	49021.8	12000.00
22	32901.50	150.01	0.904	0.30 ( 0.30)	0.99	49644.9	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 41201.98 Tc (MIN.) = 75.11  
AREA-AVERAGED Fm (INCH/HR) = 0.30 AREA-AVERAGED Fp (INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA (ACRES) = 33277.17

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12602.00 TO NODE 12603.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM (FEET) = 313.00 DOWNSTREAM (FEET) = 310.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 312.40 CHANNEL SLOPE = 0.0096  
GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 9.00  
CHANNEL FLOW THRU SUBAREA (CFS) = 41201.98  
FLOW VELOCITY (FEET/SEC.) = 18.69 FLOW DEPTH (FEET) = 9.00  
TRAVEL TIME (MIN.) = 0.28 Tc (MIN.) = 75.39  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25047.11	18.37	2.640	0.30 ( 0.30)	0.99	5797.3	31800.00
2	25572.57	19.89	2.476	0.30 ( 0.30)	0.99	6329.5	40200.00
3	26090.52	21.79	2.343	0.30 ( 0.30)	0.99	7066.2	31810.00
4	29303.09	33.65	1.806	0.30 ( 0.30)	0.99	11617.1	40100.00
5	31576.74	40.24	1.638	0.30 ( 0.30)	0.99	14008.0	11831.00
6	32375.27	42.77	1.581	0.30 ( 0.30)	0.99	14961.4	11801.00
7	35435.41	52.69	1.391	0.30 ( 0.30)	0.99	19256.8	11530.00
8	37840.72	61.53	1.309	0.30 ( 0.30)	0.99	24240.6	11910.00
9	40058.88	68.92	1.260	0.30 ( 0.30)	0.99	28846.8	11330.00
10	41201.98	75.39	1.216	0.30 ( 0.30)	0.99	33277.2	11130.00
11	41169.56	82.96	1.166	0.30 ( 0.30)	0.99	37267.4	12330.00
12	41133.16	85.56	1.149	0.30 ( 0.30)	0.99	38684.4	12410.00
13	40981.88	89.58	1.122	0.30 ( 0.30)	0.99	40610.5	12400.00
14	40518.31	98.18	1.082	0.30 ( 0.30)	0.99	43977.8	12201.00
15	40088.70	102.08	1.064	0.30 ( 0.30)	0.99	45064.1	12111.00

16	39807.55	104.44	1.054	0.30	( 0.30)	0.99	45704.4	10700.00
17	39483.08	107.36	1.040	0.30	( 0.30)	0.99	46433.4	12101.10
18	38987.08	111.32	1.022	0.30	( 0.30)	0.99	47284.2	10400.00
19	37500.42	119.10	0.987	0.30	( 0.30)	0.99	48596.3	12010.00
20	36221.91	124.80	0.970	0.30	( 0.30)	0.99	48912.9	10210.00
21	35868.50	127.38	0.964	0.30	( 0.30)	0.99	49021.8	12000.00
22	32901.50	150.31	0.904	0.30	( 0.30)	0.99	49644.9	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 41201.98 Tc(MIN.) = 75.39  
 AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 33277.17

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12602.00 TO NODE 12603.00 IS CODE = 12  
 -----

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12603.00 TO NODE 12603.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610317Y.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	145.26	16.45	2.848	0.30( 0.30)	1.00	63.3	31700.00
2	139.77	19.86	2.479	0.30( 0.30)	1.00	71.3	31710.00
TOTAL AREA(ACRES) =							71.3

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12603.00 TO NODE 12603.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25047.11	18.37	2.640	0.30( 0.30)	0.99	5797.3	31800.00
2	25572.57	19.89	2.476	0.30( 0.30)	0.99	6329.5	40200.00
3	26090.52	21.79	2.343	0.30( 0.30)	0.99	7066.2	31810.00
4	29303.09	33.65	1.806	0.30( 0.30)	0.99	11617.1	40100.00
5	31576.74	40.24	1.638	0.30( 0.30)	0.99	14008.0	11831.00
6	32375.27	42.77	1.581	0.30( 0.30)	0.99	14961.4	11801.00
7	35435.41	52.69	1.391	0.30( 0.30)	0.99	19256.8	11530.00
8	37840.72	61.53	1.309	0.30( 0.30)	0.99	24240.6	11910.00
9	40058.88	68.92	1.260	0.30( 0.30)	0.99	28846.8	11330.00
10	41201.98	75.39	1.216	0.30( 0.30)	0.99	33277.2	11130.00
11	41169.56	82.96	1.166	0.30( 0.30)	0.99	37267.4	12330.00
12	41133.16	85.56	1.149	0.30( 0.30)	0.99	38684.4	12410.00
13	40981.88	89.58	1.122	0.30( 0.30)	0.99	40610.5	12400.00
14	40518.31	98.18	1.082	0.30( 0.30)	0.99	43977.8	12201.00
15	40088.70	102.08	1.064	0.30( 0.30)	0.99	45064.1	12111.00
16	39807.55	104.44	1.054	0.30( 0.30)	0.99	45704.4	10700.00
17	39483.08	107.36	1.040	0.30( 0.30)	0.99	46433.4	12101.10
18	38987.08	111.32	1.022	0.30( 0.30)	0.99	47284.2	10400.00

19	37500.42	119.10	0.987	0.30	( 0.30)	0.99	48596.3	12010.00
20	36221.91	124.80	0.970	0.30	( 0.30)	0.99	48912.9	10210.00
21	35868.50	127.38	0.964	0.30	( 0.30)	0.99	49021.8	12000.00
22	32901.50	150.31	0.904	0.30	( 0.30)	0.99	49644.9	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	145.26	16.45	2.848	0.30( 0.30)	1.00	63.3	31700.00
2	139.77	19.86	2.479	0.30( 0.30)	1.00	71.3	31710.00

LONGEST FLOWPATH FROM NODE 31710.00 TO NODE 12603.00 = 3633.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24558.64	16.45	2.848	0.30( 0.30)	0.99	5253.9	31700.00
2	25189.28	18.37	2.640	0.30( 0.30)	0.99	5865.1	31800.00
3	25703.43	19.86	2.479	0.30( 0.30)	0.99	6391.8	31710.00
4	25712.16	19.89	2.476	0.30( 0.30)	0.99	6400.8	40200.00
5	26221.60	21.79	2.343	0.30( 0.30)	0.99	7137.4	31810.00
6	29399.72	33.65	1.806	0.30( 0.30)	0.99	11688.4	40100.00
7	31662.60	40.24	1.638	0.30( 0.30)	0.99	14079.3	11831.00
8	32457.47	42.77	1.581	0.30( 0.30)	0.99	15032.7	11801.00
9	35505.42	52.69	1.391	0.30( 0.30)	0.99	19328.1	11530.00
10	37905.43	61.53	1.309	0.30( 0.30)	0.99	24311.9	11910.00
11	40120.43	68.92	1.260	0.30( 0.30)	0.99	28918.1	11330.00
12	41260.77	75.39	1.216	0.30( 0.30)	0.99	33348.4	11130.00
13	41225.11	82.96	1.166	0.30( 0.30)	0.99	37338.7	12330.00
14	41187.60	85.56	1.149	0.30( 0.30)	0.99	38755.7	12410.00
15	41034.60	89.58	1.122	0.30( 0.30)	0.99	40681.7	12400.00
16	40568.47	98.18	1.082	0.30( 0.30)	0.99	44049.1	12201.00
17	40137.72	102.08	1.064	0.30( 0.30)	0.99	45135.4	12111.00
18	39855.89	104.44	1.054	0.30( 0.30)	0.99	45775.7	10700.00
19	39530.57	107.36	1.040	0.30( 0.30)	0.99	46504.7	12101.10
20	39033.42	111.32	1.022	0.30( 0.30)	0.99	47355.5	10400.00
21	37544.50	119.10	0.987	0.30( 0.30)	0.99	48667.6	12010.00
22	36264.91	124.80	0.970	0.30( 0.30)	0.99	48984.1	10210.00
23	35911.08	127.38	0.964	0.30( 0.30)	0.99	49093.1	12000.00
24	32940.23	150.31	0.904	0.30( 0.30)	0.99	49716.2	10100.00
TOTAL AREA(ACRES) =							49716.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 41260.77 Tc(MIN.) = 75.390  
 EFFECTIVE AREA(ACRES) = 33348.44 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 49716.2  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

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 FLOW PROCESS FROM NODE 12603.00 TO NODE 12603.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 1 <<<<<

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 FLOW PROCESS FROM NODE 12603.00 TO NODE 12603.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610403Y.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	365.26	18.67	0.30 ( 0.29)	0.97	175.0	40300.00
TOTAL AREA (ACRES) = 175.0						

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FLOW PROCESS FROM NODE 12603.00 TO NODE 12603.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24558.64	16.45	2.848	0.30 ( 0.30)	0.99	5253.9	31700.00
2	25189.28	18.37	2.640	0.30 ( 0.30)	0.99	5865.1	31800.00
3	25703.43	19.86	2.479	0.30 ( 0.30)	0.99	6391.8	31710.00
4	25712.16	19.89	2.476	0.30 ( 0.30)	0.99	6400.8	40200.00
5	26221.60	21.79	2.343	0.30 ( 0.30)	0.99	7137.4	31810.00
6	29399.72	33.65	1.806	0.30 ( 0.30)	0.99	11688.4	40100.00
7	31662.60	40.24	1.638	0.30 ( 0.30)	0.99	14079.3	11831.00
8	32457.47	42.77	1.581	0.30 ( 0.30)	0.99	15032.7	11801.00
9	35505.42	52.69	1.391	0.30 ( 0.30)	0.99	19328.1	11530.00
10	37905.43	61.53	1.309	0.30 ( 0.30)	0.99	24311.9	11910.00
11	40120.43	68.92	1.260	0.30 ( 0.30)	0.99	28918.1	11330.00
12	41260.77	75.39	1.216	0.30 ( 0.30)	0.99	33348.4	11130.00
13	41225.11	82.96	1.166	0.30 ( 0.30)	0.99	37338.7	12330.00
14	41187.60	85.56	1.149	0.30 ( 0.30)	0.99	38755.7	12410.00
15	41034.60	89.58	1.122	0.30 ( 0.30)	0.99	40681.7	12400.00
16	40568.47	98.18	1.082	0.30 ( 0.30)	0.99	44049.1	12201.00
17	40137.72	102.08	1.064	0.30 ( 0.30)	0.99	45135.4	12111.00
18	39855.89	104.44	1.054	0.30 ( 0.30)	0.99	45775.7	10700.00
19	39530.57	107.36	1.040	0.30 ( 0.30)	0.99	46504.7	12101.10
20	39033.42	111.32	1.022	0.30 ( 0.30)	0.99	47355.5	10400.00
21	37544.50	119.10	0.987	0.30 ( 0.30)	0.99	48667.6	12010.00
22	36264.91	124.80	0.970	0.30 ( 0.30)	0.99	48984.1	10210.00
23	35911.08	127.38	0.964	0.30 ( 0.30)	0.99	49093.1	12000.00
24	32940.23	150.31	0.904	0.30 ( 0.30)	0.99	49716.2	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	365.26	18.67	2.608	0.30 ( 0.29)	0.97	175.0	40300.00

LONGEST FLOWPATH FROM NODE 40300.00 TO NODE 12603.00 = 5256.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24913.73	16.45	2.848	0.30 ( 0.30)	0.99	5408.1	31700.00
2	25553.69	18.37	2.640	0.30 ( 0.30)	0.99	6037.3	31800.00
3	25657.87	18.67	2.608	0.30 ( 0.30)	0.99	6146.0	40300.00
4	26048.35	19.86	2.479	0.30 ( 0.30)	0.99	6566.8	31710.00
5	26056.65	19.89	2.476	0.30 ( 0.30)	0.99	6575.8	40200.00

6	26545.21	21.79	2.343	0.30 ( 0.30)	0.99	7312.5	31810.00
7	29638.72	33.65	1.806	0.30 ( 0.30)	0.99	11863.4	40100.00
8	31875.13	40.24	1.638	0.30 ( 0.30)	0.99	14254.3	11831.00
9	32661.01	42.77	1.581	0.30 ( 0.30)	0.99	15207.7	11801.00
10	35679.02	52.69	1.391	0.30 ( 0.30)	0.99	19503.1	11530.00
11	38066.02	61.53	1.309	0.30 ( 0.30)	0.99	24486.9	11910.00
12	40273.26	68.92	1.260	0.30 ( 0.30)	0.99	29093.1	11330.00
13	41406.80	75.39	1.216	0.30 ( 0.30)	0.99	33523.5	11130.00
14	41363.20	82.96	1.166	0.30 ( 0.30)	0.99	37513.7	12330.00
15	41322.96	85.56	1.149	0.30 ( 0.30)	0.99	38930.7	12410.00
16	41165.73	89.58	1.122	0.30 ( 0.30)	0.99	40856.8	12400.00
17	40693.32	98.18	1.082	0.30 ( 0.30)	0.99	44224.1	12201.00
18	40259.79	102.08	1.064	0.30 ( 0.30)	0.99	45310.4	12111.00
19	39976.27	104.44	1.054	0.30 ( 0.30)	0.99	45950.7	10700.00
20	39648.86	107.36	1.040	0.30 ( 0.30)	0.99	46679.8	12101.10
21	39148.89	111.32	1.022	0.30 ( 0.30)	0.99	47530.5	10400.00
22	37654.40	119.10	0.987	0.30 ( 0.30)	0.99	48842.6	12010.00
23	36372.20	124.80	0.970	0.30 ( 0.30)	0.99	49159.2	10210.00
24	36017.30	127.38	0.964	0.30 ( 0.30)	0.99	49268.1	12000.00
25	33037.00	150.31	0.904	0.30 ( 0.30)	0.99	49891.2	10100.00

TOTAL AREA (ACRES) = 49891.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 41406.80 Tc (MIN.) = 75.390  
EFFECTIVE AREA (ACRES) = 33523.49 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 49891.2  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

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FLOW PROCESS FROM NODE 12603.00 TO NODE 12604.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 310.00 DOWNSTREAM (FEET) = 307.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 459.69 CHANNEL SLOPE = 0.0065  
GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 10.07  
CHANNEL FLOW THRU SUBAREA (CFS) = 41406.80  
FLOW VELOCITY (FEET/SEC.) = 16.43 FLOW DEPTH (FEET) = 10.07  
TRAVEL TIME (MIN.) = 0.47 Tc (MIN.) = 75.86  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12604.00 = 102017.99 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24913.73	17.00	2.788	0.30 ( 0.30)	0.99	5408.1	31700.00
2	25553.69	18.91	2.581	0.30 ( 0.30)	0.99	6037.3	31800.00
3	25657.87	19.21	2.549	0.30 ( 0.30)	0.99	6146.0	40300.00
4	26048.35	20.41	2.437	0.30 ( 0.30)	0.99	6566.8	31710.00
5	26056.65	20.43	2.435	0.30 ( 0.30)	0.99	6575.8	40200.00
6	26545.21	22.33	2.307	0.30 ( 0.30)	0.99	7312.5	31810.00
7	29638.72	34.17	1.793	0.30 ( 0.30)	0.99	11863.4	40100.00
8	31875.13	40.75	1.627	0.30 ( 0.30)	0.99	14254.3	11831.00
9	32661.01	43.27	1.570	0.30 ( 0.30)	0.99	15207.7	11801.00
10	35679.02	53.18	1.387	0.30 ( 0.30)	0.99	19503.1	11530.00

11 38066.02 62.01 1.306 0.30( 0.30) 0.99 24486.9 11910.00  
12 40273.26 69.39 1.256 0.30( 0.30) 0.99 29093.1 11330.00  
13 41406.80 75.86 1.213 0.30( 0.30) 0.99 33523.5 11130.00  
14 41363.20 83.43 1.163 0.30( 0.30) 0.99 37513.7 12330.00  
15 41322.96 86.02 1.146 0.30( 0.30) 0.99 38930.7 12410.00  
16 41165.73 90.04 1.119 0.30( 0.30) 0.99 40856.8 12400.00  
17 40693.32 98.65 1.080 0.30( 0.30) 0.99 44224.1 12201.00  
18 40259.79 102.55 1.062 0.30( 0.30) 0.99 45310.4 12111.00  
19 39976.27 104.91 1.051 0.30( 0.30) 0.99 45950.7 10700.00  
20 39648.86 107.84 1.038 0.30( 0.30) 0.99 46679.8 12101.10  
21 39148.89 111.79 1.020 0.30( 0.30) 0.99 47530.5 10400.00  
22 37654.40 119.58 0.985 0.30( 0.30) 0.99 48842.6 12010.00  
23 36372.20 125.29 0.969 0.30( 0.30) 0.99 49159.2 10210.00  
24 36017.30 127.87 0.962 0.30( 0.30) 0.99 49268.1 12000.00  
25 33037.00 150.81 0.902 0.30( 0.30) 0.99 49891.2 10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 41406.80 Tc(MIN.) = 75.86  
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 33523.49

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FLOW PROCESS FROM NODE 12603.00 TO NODE 12604.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<<

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FLOW PROCESS FROM NODE 12604.00 TO NODE 12605.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 307.00 DOWNSTREAM(FEET) = 305.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 427.54 CHANNEL SLOPE = 0.0047  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 11.05  
CHANNEL FLOW THRU SUBAREA(CFS) = 41406.80  
FLOW VELOCITY(FEET/SEC.) = 14.68 FLOW DEPTH(FEET) = 11.05  
TRAVEL TIME(MIN.) = 0.49 Tc(MIN.) = 76.34  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.00 = 102445.53 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24913.73	17.57	2.727	0.30( 0.30)	0.99	5408.1	31700.00
2	25553.69	19.48	2.520	0.30( 0.30)	0.99	6037.3	31800.00
3	25657.87	19.78	2.488	0.30( 0.30)	0.99	6146.0	40300.00
4	26048.35	20.97	2.399	0.30( 0.30)	0.99	6566.8	31710.00
5	26056.65	21.00	2.397	0.30( 0.30)	0.99	6575.8	40200.00
6	26545.21	22.89	2.270	0.30( 0.30)	0.99	7312.5	31810.00
7	29638.72	34.72	1.779	0.30( 0.30)	0.99	11863.4	40100.00
8	31875.13	41.28	1.615	0.30( 0.30)	0.99	14254.3	11831.00
9	32661.01	43.80	1.558	0.30( 0.30)	0.99	15207.7	11801.00
10	35679.02	53.69	1.381	0.30( 0.30)	0.99	19503.1	11530.00
11	38066.02	62.51	1.302	0.30( 0.30)	0.99	24486.9	11910.00
12	40273.26	69.88	1.253	0.30( 0.30)	0.99	29093.1	11330.00
13	41406.80	76.34	1.210	0.30( 0.30)	0.99	33523.5	11130.00

14 41363.20 83.91 1.160 0.30( 0.30) 0.99 37513.7 12330.00  
15 41322.96 86.51 1.142 0.30( 0.30) 0.99 38930.7 12410.00  
16 41165.73 90.53 1.117 0.30( 0.30) 0.99 40856.8 12400.00  
17 40693.32 99.13 1.078 0.30( 0.30) 0.99 44224.1 12201.00  
18 40259.79 103.04 1.060 0.30( 0.30) 0.99 45310.4 12111.00  
19 39976.27 105.40 1.049 0.30( 0.30) 0.99 45950.7 10700.00  
20 39648.86 108.33 1.036 0.30( 0.30) 0.99 46679.8 12101.10  
21 39148.89 112.29 1.018 0.30( 0.30) 0.99 47530.5 10400.00  
22 37654.40 120.08 0.983 0.30( 0.30) 0.99 48842.6 12010.00  
23 36372.20 125.80 0.968 0.30( 0.30) 0.99 49159.2 10210.00  
24 36017.30 128.38 0.961 0.30( 0.30) 0.99 49268.1 12000.00  
25 33037.00 151.33 0.901 0.30( 0.30) 0.99 49891.2 10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 41406.80 Tc(MIN.) = 76.34  
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 33523.49

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FLOW PROCESS FROM NODE 12604.00 TO NODE 12605.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*MEMORY BANK # 3 IS EMPTY - PROCESS IGNORED.\*\*\*

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FLOW PROCESS FROM NODE 12605.00 TO NODE 12605.30 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 305.00 DOWNSTREAM(FEET) = 302.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 217.28 CHANNEL SLOPE = 0.0138  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.14  
CHANNEL FLOW THRU SUBAREA(CFS) = 41406.80  
FLOW VELOCITY(FEET/SEC.) = 21.14 FLOW DEPTH(FEET) = 8.14  
TRAVEL TIME(MIN.) = 0.17 Tc(MIN.) = 76.51  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.30 = 102662.81 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24913.73	17.77	2.705	0.30( 0.30)	0.99	5408.1	31700.00
2	25553.69	19.68	2.498	0.30( 0.30)	0.99	6037.3	31800.00
3	25657.87	19.98	2.466	0.30( 0.30)	0.99	6146.0	40300.00
4	26048.35	21.17	2.385	0.30( 0.30)	0.99	6566.8	31710.00
5	26056.65	21.20	2.384	0.30( 0.30)	0.99	6575.8	40200.00
6	26545.21	23.09	2.256	0.30( 0.30)	0.99	7312.5	31810.00
7	29638.72	34.91	1.774	0.30( 0.30)	0.99	11863.4	40100.00
8	31875.13	41.47	1.611	0.30( 0.30)	0.99	14254.3	11831.00
9	32661.01	43.98	1.554	0.30( 0.30)	0.99	15207.7	11801.00
10	35679.02	53.87	1.380	0.30( 0.30)	0.99	19503.1	11530.00
11	38066.02	62.69	1.301	0.30( 0.30)	0.99	24486.9	11910.00
12	40273.26	70.06	1.252	0.30( 0.30)	0.99	29093.1	11330.00
13	41406.80	76.51	1.209	0.30( 0.30)	0.99	33523.5	11130.00
14	41363.20	84.08	1.158	0.30( 0.30)	0.99	37513.7	12330.00
15	41322.96	86.68	1.141	0.30( 0.30)	0.99	38930.7	12410.00



16	41165.73	90.70	1.116	0.30	( 0.30)	0.99	40856.8	12400.00
17	40693.32	99.31	1.077	0.30	( 0.30)	0.99	44224.1	12201.00
18	40259.79	103.21	1.059	0.30	( 0.30)	0.99	45310.4	12111.00
19	39976.27	105.57	1.048	0.30	( 0.30)	0.99	45950.7	10700.00
20	39648.86	108.50	1.035	0.30	( 0.30)	0.99	46679.8	12101.10
21	39148.89	112.46	1.017	0.30	( 0.30)	0.99	47530.5	10400.00
22	37654.40	120.26	0.982	0.30	( 0.30)	0.99	48842.6	12010.00
23	36372.20	125.98	0.967	0.30	( 0.30)	0.99	49159.2	10210.00
24	36017.30	128.56	0.961	0.30	( 0.30)	0.99	49268.1	12000.00
25	33037.00	151.52	0.901	0.30	( 0.30)	0.99	49891.2	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 41406.80 Tc(MIN.) = 76.51  
 AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 33523.49

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FLOW PROCESS FROM NODE 12605.30 TO NODE 12605.30 IS CODE = 12

>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*MEMORY BANK # 3 IS EMPTY - PROCESS IGNORED.\*\*\*

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FLOW PROCESS FROM NODE 12605.30 TO NODE 12605.30 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610404Y.DNA  
 MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	868.67	17.52	0.30 ( 0.30)	0.99	396.5	40430.00
2	857.31	18.07	0.30 ( 0.30)	0.99	401.1	40440.00
3	831.27	19.17	0.30 ( 0.30)	0.99	409.4	40400.00
4	825.53	19.36	0.30 ( 0.30)	0.99	410.3	40420.00
5	824.28	19.40	0.30 ( 0.30)	0.99	410.5	40410.00
TOTAL AREA(ACRES) =						410.5

\*\*\*\*\*

FLOW PROCESS FROM NODE 12605.30 TO NODE 12605.30 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24913.73	17.77	2.705	0.30 ( 0.30)	0.99	5408.1	31700.00
2	25553.69	19.68	2.498	0.30 ( 0.30)	0.99	6037.3	31800.00
3	25657.87	19.98	2.466	0.30 ( 0.30)	0.99	6146.0	40300.00
4	26048.35	21.17	2.385	0.30 ( 0.30)	0.99	6566.8	31710.00
5	26056.65	21.20	2.384	0.30 ( 0.30)	0.99	6575.8	40200.00
6	26545.21	23.09	2.256	0.30 ( 0.30)	0.99	7312.5	31810.00
7	29638.72	34.91	1.774	0.30 ( 0.30)	0.99	11863.4	40100.00
8	31875.13	41.47	1.611	0.30 ( 0.30)	0.99	14254.3	11831.00
9	32661.01	43.98	1.554	0.30 ( 0.30)	0.99	15207.7	11801.00
10	35679.02	53.87	1.380	0.30 ( 0.30)	0.99	19503.1	11530.00
11	38066.02	62.69	1.301	0.30 ( 0.30)	0.99	24486.9	11910.00

12	40273.26	70.06	1.252	0.30	( 0.30)	0.99	29093.1	11330.00
13	41406.80	76.51	1.209	0.30	( 0.30)	0.99	33523.5	11130.00
14	41363.20	84.08	1.158	0.30	( 0.30)	0.99	37513.7	12330.00
15	41322.96	86.68	1.141	0.30	( 0.30)	0.99	38930.7	12410.00
16	41165.73	90.70	1.116	0.30	( 0.30)	0.99	40856.8	12400.00
17	40693.32	99.31	1.077	0.30	( 0.30)	0.99	44224.1	12201.00
18	40259.79	103.21	1.059	0.30	( 0.30)	0.99	45310.4	12111.00
19	39976.27	105.57	1.048	0.30	( 0.30)	0.99	45950.7	10700.00
20	39648.86	108.50	1.035	0.30	( 0.30)	0.99	46679.8	12101.10
21	39148.89	112.46	1.017	0.30	( 0.30)	0.99	47530.5	10400.00
22	37654.40	120.26	0.982	0.30	( 0.30)	0.99	48842.6	12010.00
23	36372.20	125.98	0.967	0.30	( 0.30)	0.99	49159.2	10210.00
24	36017.30	128.56	0.961	0.30	( 0.30)	0.99	49268.1	12000.00
25	33037.00	151.52	0.901	0.30	( 0.30)	0.99	49891.2	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.30 = 102662.81 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	868.67	17.52	2.732	0.30 ( 0.30)	0.99	396.5	40430.00
2	857.31	18.07	2.672	0.30 ( 0.30)	0.99	401.1	40440.00
3	831.27	19.17	2.553	0.30 ( 0.30)	0.99	409.4	40400.00
4	825.53	19.36	2.533	0.30 ( 0.30)	0.99	410.3	40420.00
5	824.28	19.40	2.529	0.30 ( 0.30)	0.99	410.5	40410.00

LONGEST FLOWPATH FROM NODE 40400.00 TO NODE 12605.30 = 7428.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25707.54	17.52	2.732	0.30 ( 0.30)	0.99	5728.6	40430.00
2	25777.23	17.77	2.705	0.30 ( 0.30)	0.99	5806.7	31700.00
3	25871.28	18.07	2.672	0.30 ( 0.30)	0.99	5907.7	40440.00
4	26213.94	19.17	2.553	0.30 ( 0.30)	0.99	6278.6	40400.00
5	26272.51	19.36	2.533	0.30 ( 0.30)	0.99	6342.7	40420.00
6	26283.78	19.40	2.529	0.30 ( 0.30)	0.99	6355.2	40410.00
7	26366.75	19.68	2.498	0.30 ( 0.30)	0.99	6447.8	31800.00
8	26459.00	19.98	2.466	0.30 ( 0.30)	0.99	6556.4	40300.00
9	26819.74	21.17	2.385	0.30 ( 0.30)	0.99	6977.3	31710.00
10	26827.38	21.20	2.384	0.30 ( 0.30)	0.99	6986.3	40200.00
11	27268.87	23.09	2.256	0.30 ( 0.30)	0.99	7722.9	31810.00
12	30184.39	34.91	1.774	0.30 ( 0.30)	0.99	12273.9	40100.00
13	32360.38	41.47	1.611	0.30 ( 0.30)	0.99	14664.8	11831.00
14	33125.27	43.98	1.554	0.30 ( 0.30)	0.99	15618.2	11801.00
15	36078.88	53.87	1.380	0.30 ( 0.30)	0.99	19913.6	11530.00
16	38436.84	62.69	1.301	0.30 ( 0.30)	0.99	24897.4	11910.00
17	40625.93	70.06	1.252	0.30 ( 0.30)	0.99	29503.6	11330.00
18	41743.58	76.51	1.209	0.30 ( 0.30)	0.99	33934.0	11130.00
19	41681.32	84.08	1.158	0.30 ( 0.30)	0.99	37924.2	12330.00
20	41634.69	86.68	1.141	0.30 ( 0.30)	0.99	39341.2	12410.00
21	41468.11	90.70	1.116	0.30 ( 0.30)	0.99	41267.2	12400.00
22	40981.29	99.31	1.077	0.30 ( 0.30)	0.99	44634.6	12201.00
23	40541.21	103.21	1.059	0.30 ( 0.30)	0.99	45720.9	12111.00
24	40253.74	105.57	1.048	0.30 ( 0.30)	0.99	46361.2	10700.00
25	39921.43	108.50	1.035	0.30 ( 0.30)	0.99	47090.2	12101.10
26	39414.83	112.46	1.017	0.30 ( 0.30)	0.99	47941.0	10400.00
27	37907.46	120.26	0.982	0.30 ( 0.30)	0.99	49253.1	12010.00
28	36619.73	125.98	0.967	0.30 ( 0.30)	0.99	49569.6	10210.00
29	36262.35	128.56	0.961	0.30 ( 0.30)	0.99	49678.6	12000.00

30 33259.84 151.52 0.901 0.30( 0.30) 0.99 50301.7 10100.00  
TOTAL AREA (ACRES) = 50301.7

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 41743.58 Tc(MIN.) = 76.513  
EFFECTIVE AREA(ACRES) = 33933.95 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 50301.7  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.30 = 102662.81 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12605.30 TO NODE 12605.60 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 302.00 DOWNSTREAM(FEET) = 295.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 738.76 CHANNEL SLOPE = 0.0095  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 9.10  
CHANNEL FLOW THRU SUBAREA(CFS) = 41743.58  
FLOW VELOCITY(FEET/SEC.) = 18.69 FLOW DEPTH(FEET) = 9.10  
TRAVEL TIME(MIN.) = 0.66 Tc(MIN.) = 77.17  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.60 = 103401.57 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25707.54	18.30	2.648	0.30( 0.30)	0.99	5728.6	40430.00
2	25777.23	18.55	2.621	0.30( 0.30)	0.99	5806.7	31700.00
3	25871.28	18.84	2.589	0.30( 0.30)	0.99	5907.7	40440.00
4	26213.94	19.94	2.470	0.30( 0.30)	0.99	6278.6	40400.00
5	26272.51	20.13	2.455	0.30( 0.30)	0.99	6342.7	40420.00
6	26283.78	20.17	2.453	0.30( 0.30)	0.99	6355.2	40410.00
7	26366.75	20.45	2.434	0.30( 0.30)	0.99	6447.8	31800.00
8	26459.00	20.75	2.414	0.30( 0.30)	0.99	6556.4	40300.00
9	26819.74	21.93	2.334	0.30( 0.30)	0.99	6977.3	31710.00
10	26827.38	21.96	2.332	0.30( 0.30)	0.99	6986.3	40200.00
11	27268.87	23.85	2.205	0.30( 0.30)	0.99	7722.9	31810.00
12	30184.39	35.64	1.756	0.30( 0.30)	0.99	12273.9	40100.00
13	32360.38	42.18	1.595	0.30( 0.30)	0.99	14664.8	11831.00
14	33125.27	44.69	1.538	0.30( 0.30)	0.99	15618.2	11801.00
15	36078.88	54.56	1.373	0.30( 0.30)	0.99	19913.6	11530.00
16	38436.84	63.37	1.297	0.30( 0.30)	0.99	24897.4	11910.00
17	40625.93	70.72	1.248	0.30( 0.30)	0.99	29503.6	11330.00
18	41743.58	77.17	1.205	0.30( 0.30)	0.99	33934.0	11130.00
19	41681.32	84.74	1.154	0.30( 0.30)	0.99	37924.2	12330.00
20	41634.69	87.34	1.137	0.30( 0.30)	0.99	39341.2	12410.00
21	41468.11	91.36	1.113	0.30( 0.30)	0.99	41267.2	12400.00
22	40981.29	99.97	1.074	0.30( 0.30)	0.99	44634.6	12201.00
23	40541.21	103.88	1.056	0.30( 0.30)	0.99	45720.9	12111.00
24	40253.74	106.24	1.045	0.30( 0.30)	0.99	46361.2	10700.00
25	39921.43	109.17	1.032	0.30( 0.30)	0.99	47090.2	12101.10
26	39414.83	113.13	1.014	0.30( 0.30)	0.99	47941.0	10400.00
27	37907.46	120.94	0.981	0.30( 0.30)	0.99	49253.1	12010.00
28	36619.73	126.66	0.966	0.30( 0.30)	0.99	49569.6	10210.00
29	36262.35	129.25	0.959	0.30( 0.30)	0.99	49678.6	12000.00

30 33259.84 152.23 0.899 0.30( 0.30) 0.99 50301.7 10100.00  
NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 41743.58 Tc(MIN.) = 77.17  
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 33933.95

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12605.60 TO NODE 12605.60 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12605.60 TO NODE 12605.60 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<

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PEAK FLOWRATE TABLE FILE NAME: 0610405Y.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	203.13	13.78	0.30( 0.30)	1.00	77.2	40510.00
2	196.61	15.19	0.30( 0.30)	1.00	81.4	40500.00
TOTAL AREA(ACRES) =		81.4				

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FLOW PROCESS FROM NODE 12605.60 TO NODE 12605.60 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25707.54	18.30	2.648	0.30( 0.30)	0.99	5728.6	40430.00
2	25777.23	18.55	2.621	0.30( 0.30)	0.99	5806.7	31700.00
3	25871.28	18.84	2.589	0.30( 0.30)	0.99	5907.7	40440.00
4	26213.94	19.94	2.470	0.30( 0.30)	0.99	6278.6	40400.00
5	26272.51	20.13	2.455	0.30( 0.30)	0.99	6342.7	40420.00
6	26283.78	20.17	2.453	0.30( 0.30)	0.99	6355.2	40410.00
7	26366.75	20.45	2.434	0.30( 0.30)	0.99	6447.8	31800.00
8	26459.00	20.75	2.414	0.30( 0.30)	0.99	6556.4	40300.00
9	26819.74	21.93	2.334	0.30( 0.30)	0.99	6977.3	31710.00
10	26827.38	21.96	2.332	0.30( 0.30)	0.99	6986.3	40200.00
11	27268.87	23.85	2.205	0.30( 0.30)	0.99	7722.9	31810.00
12	30184.39	35.64	1.756	0.30( 0.30)	0.99	12273.9	40100.00
13	32360.38	42.18	1.595	0.30( 0.30)	0.99	14664.8	11831.00
14	33125.27	44.69	1.538	0.30( 0.30)	0.99	15618.2	11801.00
15	36078.88	54.56	1.373	0.30( 0.30)	0.99	19913.6	11530.00
16	38436.84	63.37	1.297	0.30( 0.30)	0.99	24897.4	11910.00
17	40625.93	70.72	1.248	0.30( 0.30)	0.99	29503.6	11330.00
18	41743.58	77.17	1.205	0.30( 0.30)	0.99	33934.0	11130.00
19	41681.32	84.74	1.154	0.30( 0.30)	0.99	37924.2	12330.00
20	41634.69	87.34	1.137	0.30( 0.30)	0.99	39341.2	12410.00
21	41468.11	91.36	1.113	0.30( 0.30)	0.99	41267.2	12400.00
22	40981.29	99.97	1.074	0.30( 0.30)	0.99	44634.6	12201.00
23	40541.21	103.88	1.056	0.30( 0.30)	0.99	45720.9	12111.00
24	40253.74	106.24	1.045	0.30( 0.30)	0.99	46361.2	10700.00

25 39921.43 109.17 1.032 0.30( 0.30) 0.99 47090.2 12101.10  
 26 39414.83 113.13 1.014 0.30( 0.30) 0.99 47941.0 10400.00  
 27 37907.46 120.94 0.981 0.30( 0.30) 0.99 49253.1 12010.00  
 28 36619.73 126.66 0.966 0.30( 0.30) 0.99 49569.6 10210.00  
 29 36262.35 129.25 0.959 0.30( 0.30) 0.99 49678.6 12000.00  
 30 33259.84 152.23 0.899 0.30( 0.30) 0.99 50301.7 10100.00  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.60 = 103401.57 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	203.13	13.78	3.222	0.30( 0.30)	1.00	77.2	40510.00
2	196.61	15.19	2.984	0.30( 0.30)	1.00	81.4	40500.00

LONGEST FLOWPATH FROM NODE 40500.00 TO NODE 12605.60 = 4091.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24296.55	13.78	3.222	0.30( 0.30)	0.99	4391.6	40510.00
2	24584.65	15.19	2.984	0.30( 0.30)	0.99	4836.5	40500.00
3	25879.56	18.30	2.648	0.30( 0.30)	0.99	5809.9	40430.00
4	25947.28	18.55	2.621	0.30( 0.30)	0.99	5888.1	31700.00
5	26038.96	18.84	2.589	0.30( 0.30)	0.99	5989.1	40440.00
6	26372.95	19.94	2.470	0.30( 0.30)	0.99	6359.9	40400.00
7	26430.40	20.13	2.455	0.30( 0.30)	0.99	6424.1	40420.00
8	26441.49	20.17	2.453	0.30( 0.30)	0.99	6436.5	40410.00
9	26523.08	20.45	2.434	0.30( 0.30)	0.99	6529.1	31800.00
10	26613.86	20.75	2.414	0.30( 0.30)	0.99	6637.8	40300.00
11	26968.77	21.93	2.334	0.30( 0.30)	0.99	7058.6	31710.00
12	26976.28	21.96	2.332	0.30( 0.30)	0.99	7067.7	40200.00
13	27408.46	23.85	2.205	0.30( 0.30)	0.99	7804.3	31810.00
14	30291.06	35.64	1.756	0.30( 0.30)	0.99	12355.3	40100.00
15	32455.25	42.18	1.595	0.30( 0.30)	0.99	14746.2	11831.00
16	33216.00	44.69	1.538	0.30( 0.30)	0.99	15699.6	11801.00
17	36157.51	54.56	1.373	0.30( 0.30)	0.99	19995.0	11530.00
18	38509.88	63.37	1.297	0.30( 0.30)	0.99	24978.8	11910.00
19	40695.38	70.72	1.248	0.30( 0.30)	0.99	29585.0	11330.00
20	41809.88	77.17	1.205	0.30( 0.30)	0.99	34015.3	11130.00
21	41743.93	84.74	1.154	0.30( 0.30)	0.99	38005.6	12330.00
22	41696.02	87.34	1.137	0.30( 0.30)	0.99	39422.6	12410.00
23	41527.70	91.36	1.113	0.30( 0.30)	0.99	41348.6	12400.00
24	41038.02	99.97	1.074	0.30( 0.30)	0.99	44716.0	12201.00
25	40596.64	103.88	1.056	0.30( 0.30)	0.99	45802.2	12111.00
26	40308.39	106.24	1.045	0.30( 0.30)	0.99	46442.6	10700.00
27	39975.10	109.17	1.032	0.30( 0.30)	0.99	47171.6	12101.10
28	39467.18	113.13	1.014	0.30( 0.30)	0.99	48022.4	10400.00
29	37957.36	120.94	0.981	0.30( 0.30)	0.99	49334.5	12010.00
30	36668.54	126.66	0.966	0.30( 0.30)	0.99	49651.0	10210.00
31	36310.65	129.25	0.959	0.30( 0.30)	0.99	49759.9	12000.00
32	33303.74	152.23	0.899	0.30( 0.30)	0.99	50383.1	10100.00

TOTAL AREA (ACRES) = 50383.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 41809.88 Tc(MIN.) = 77.172  
 EFFECTIVE AREA(ACRES) = 34015.33 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 50383.1  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.60 = 103401.57 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12605.60 TO NODE 12606.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 295.00 DOWNSTREAM(FEET) = 286.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1203.43 CHANNEL SLOPE = 0.0075  
 GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 9.74  
 CHANNEL FLOW THRU SUBAREA(CFS) = 41809.88  
 FLOW VELOCITY(FEET/SEC.) = 17.26 FLOW DEPTH(FEET) = 9.74  
 TRAVEL TIME(MIN.) = 1.16 Tc(MIN.) = 78.33  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12606.00 = 104605.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24296.55	15.17	2.986	0.30( 0.30)	0.99	4391.6	40510.00
2	24584.65	16.57	2.834	0.30( 0.30)	0.99	4836.5	40500.00
3	25879.56	19.66	2.501	0.30( 0.30)	0.99	5809.9	40430.00
4	25947.28	19.91	2.474	0.30( 0.30)	0.99	5888.1	31700.00
5	26038.96	20.20	2.450	0.30( 0.30)	0.99	5989.1	40440.00
6	26372.95	21.30	2.377	0.30( 0.30)	0.99	6359.9	40400.00
7	26430.40	21.49	2.364	0.30( 0.30)	0.99	6424.1	40420.00
8	26441.49	21.52	2.362	0.30( 0.30)	0.99	6436.5	40410.00
9	26523.08	21.80	2.343	0.30( 0.30)	0.99	6529.1	31800.00
10	26613.86	22.10	2.323	0.30( 0.30)	0.99	6637.8	40300.00
11	26968.77	23.28	2.244	0.30( 0.30)	0.99	7058.6	31710.00
12	26976.28	23.30	2.242	0.30( 0.30)	0.99	7067.7	40200.00
13	27408.46	25.19	2.119	0.30( 0.30)	0.99	7804.3	31810.00
14	30291.06	36.93	1.723	0.30( 0.30)	0.99	12355.3	40100.00
15	32455.25	43.45	1.566	0.30( 0.30)	0.99	14746.2	11831.00
16	33216.00	45.95	1.510	0.30( 0.30)	0.99	15699.6	11801.00
17	36157.51	55.78	1.361	0.30( 0.30)	0.99	19995.0	11530.00
18	38509.88	64.56	1.289	0.30( 0.30)	0.99	24978.8	11910.00
19	40695.38	71.89	1.240	0.30( 0.30)	0.99	29585.0	11330.00
20	41809.88	78.33	1.197	0.30( 0.30)	0.99	34015.3	11130.00
21	41743.93	85.91	1.146	0.30( 0.30)	0.99	38005.6	12330.00
22	41696.02	88.50	1.129	0.30( 0.30)	0.99	39422.6	12410.00
23	41527.70	92.53	1.108	0.30( 0.30)	0.99	41348.6	12400.00
24	41038.02	101.14	1.069	0.30( 0.30)	0.99	44716.0	12201.00
25	40596.64	105.05	1.051	0.30( 0.30)	0.99	45802.2	12111.00
26	40308.39	107.42	1.040	0.30( 0.30)	0.99	46442.6	10700.00
27	39975.10	110.35	1.027	0.30( 0.30)	0.99	47171.6	12101.10
28	39467.18	114.32	1.009	0.30( 0.30)	0.99	48022.4	10400.00
29	37957.36	122.14	0.977	0.30( 0.30)	0.99	49334.5	12010.00
30	36668.54	127.88	0.962	0.30( 0.30)	0.99	49651.0	10210.00
31	36310.65	130.46	0.956	0.30( 0.30)	0.99	49759.9	12000.00
32	33303.74	153.48	0.895	0.30( 0.30)	0.99	50383.1	10100.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 41809.88 Tc(MIN.) = 78.33  
 AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 34015.33

\*\*\*\*\*

FLOW PROCESS FROM NODE 12606.00 TO NODE 12606.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12606.00 TO NODE 12606.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610406Y.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	262.33	20.09	0.30 ( 0.30)	0.99	135.0	40600.00
TOTAL AREA (ACRES) =						135.0

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12606.00 TO NODE 12606.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24296.55	15.17	2.986	0.30 ( 0.30)	0.99	4391.6	40510.00
2	24584.65	16.57	2.834	0.30 ( 0.30)	0.99	4836.5	40500.00
3	25879.56	19.66	2.501	0.30 ( 0.30)	0.99	5809.9	40430.00
4	25947.28	19.91	2.474	0.30 ( 0.30)	0.99	5888.1	31700.00
5	26038.96	20.20	2.450	0.30 ( 0.30)	0.99	5989.1	40440.00
6	26372.95	21.30	2.377	0.30 ( 0.30)	0.99	6359.9	40400.00
7	26430.40	21.49	2.364	0.30 ( 0.30)	0.99	6424.1	40420.00
8	26441.49	21.52	2.362	0.30 ( 0.30)	0.99	6436.5	40410.00
9	26523.08	21.80	2.343	0.30 ( 0.30)	0.99	6529.1	31800.00
10	26613.86	22.10	2.323	0.30 ( 0.30)	0.99	6637.8	40300.00
11	26968.77	23.28	2.244	0.30 ( 0.30)	0.99	7058.6	31710.00
12	26976.28	23.30	2.242	0.30 ( 0.30)	0.99	7067.7	40200.00
13	27408.46	25.19	2.119	0.30 ( 0.30)	0.99	7804.3	31810.00
14	30291.06	36.93	1.723	0.30 ( 0.30)	0.99	12355.3	40100.00
15	32455.25	43.45	1.566	0.30 ( 0.30)	0.99	14746.2	11831.00
16	33216.00	45.95	1.510	0.30 ( 0.30)	0.99	15699.6	11801.00
17	36157.51	55.78	1.361	0.30 ( 0.30)	0.99	19995.0	11530.00
18	38509.88	64.56	1.289	0.30 ( 0.30)	0.99	24978.8	11910.00
19	40695.38	71.89	1.240	0.30 ( 0.30)	0.99	29585.0	11330.00
20	41809.88	78.33	1.197	0.30 ( 0.30)	0.99	34015.3	11130.00
21	41743.93	85.91	1.146	0.30 ( 0.30)	0.99	38005.6	12330.00
22	41696.02	88.50	1.129	0.30 ( 0.30)	0.99	39422.6	12410.00
23	41527.70	92.53	1.108	0.30 ( 0.30)	0.99	41348.6	12400.00
24	41038.02	101.14	1.069	0.30 ( 0.30)	0.99	44716.0	12201.00
25	40596.64	105.05	1.051	0.30 ( 0.30)	0.99	45802.2	12111.00
26	40308.39	107.42	1.040	0.30 ( 0.30)	0.99	46442.6	10700.00
27	39975.10	110.35	1.027	0.30 ( 0.30)	0.99	47171.6	12101.10
28	39467.18	114.32	1.009	0.30 ( 0.30)	0.99	48022.4	10400.00
29	37957.36	122.14	0.977	0.30 ( 0.30)	0.99	49334.5	12010.00
30	36668.54	127.88	0.962	0.30 ( 0.30)	0.99	49651.0	10210.00
31	36310.65	130.46	0.956	0.30 ( 0.30)	0.99	49759.9	12000.00
32	33303.74	153.48	0.895	0.30 ( 0.30)	0.99	50383.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12606.00 = 104605.00 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	262.33	20.09	2.458	0.30 ( 0.30)	0.99	135.0	40600.00

LONGEST FLOWPATH FROM NODE 40600.00 TO NODE 12606.00 = 6107.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24543.04	15.17	2.986	0.30 ( 0.30)	0.99	4493.5	40510.00
2	24838.76	16.57	2.834	0.30 ( 0.30)	0.99	4947.8	40500.00
3	26141.36	19.66	2.501	0.30 ( 0.30)	0.99	5942.0	40430.00
4	26209.15	19.91	2.474	0.30 ( 0.30)	0.99	6021.8	31700.00
5	26266.47	20.09	2.458	0.30 ( 0.30)	0.99	6085.7	40600.00
6	26300.38	20.20	2.450	0.30 ( 0.30)	0.99	6124.1	40440.00
7	26625.44	21.30	2.377	0.30 ( 0.30)	0.99	6494.9	40400.00
8	26681.34	21.49	2.364	0.30 ( 0.30)	0.99	6559.1	40420.00
9	26692.13	21.52	2.362	0.30 ( 0.30)	0.99	6571.5	40410.00
10	26771.44	21.80	2.343	0.30 ( 0.30)	0.99	6664.1	31800.00
11	26859.79	22.10	2.323	0.30 ( 0.30)	0.99	6772.8	40300.00
12	27205.09	23.28	2.244	0.30 ( 0.30)	0.99	7193.6	31710.00
13	27212.39	23.30	2.242	0.30 ( 0.30)	0.99	7202.6	40200.00
14	27629.68	25.19	2.119	0.30 ( 0.30)	0.99	7939.3	31810.00
15	30464.06	36.93	1.723	0.30 ( 0.30)	0.99	12490.2	40100.00
16	32609.25	43.45	1.566	0.30 ( 0.30)	0.99	14881.1	11831.00
17	33363.13	45.95	1.510	0.30 ( 0.30)	0.99	15834.5	11801.00
18	36286.57	55.78	1.361	0.30 ( 0.30)	0.99	20129.9	11530.00
19	38630.17	64.56	1.289	0.30 ( 0.30)	0.99	25113.8	11910.00
20	40809.73	71.89	1.240	0.30 ( 0.30)	0.99	29719.9	11330.00
21	41919.01	78.33	1.197	0.30 ( 0.30)	0.99	34150.3	11130.00
22	41846.93	85.91	1.146	0.30 ( 0.30)	0.99	38140.5	12330.00
23	41796.92	88.50	1.129	0.30 ( 0.30)	0.99	39557.6	12410.00
24	41626.00	92.53	1.108	0.30 ( 0.30)	0.99	41483.6	12400.00
25	41131.57	101.14	1.069	0.30 ( 0.30)	0.99	44850.9	12201.00
26	40688.04	105.05	1.051	0.30 ( 0.30)	0.99	45937.2	12111.00
27	40398.48	107.42	1.040	0.30 ( 0.30)	0.99	46577.5	10700.00
28	40063.58	110.35	1.027	0.30 ( 0.30)	0.99	47306.6	12101.10
29	39553.48	114.32	1.009	0.30 ( 0.30)	0.99	48157.3	10400.00
30	38039.84	122.14	0.977	0.30 ( 0.30)	0.99	49469.4	12010.00
31	36749.20	127.88	0.962	0.30 ( 0.30)	0.99	49786.0	10210.00
32	36390.49	130.46	0.956	0.30 ( 0.30)	0.99	49894.9	12000.00
33	33376.27	153.48	0.895	0.30 ( 0.30)	0.99	50518.0	10100.00
TOTAL AREA (ACRES) =						50518.0	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 41919.01 Tc (MIN.) = 78.334  
EFFECTIVE AREA (ACRES) = 34150.30 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 50518.0  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12606.00 = 104605.00 FEET.

=====  
END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 50518.0 TC (MIN.) = 78.33  
EFFECTIVE AREA (ACRES) = 34150.30 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.994  
PEAK FLOW RATE (CFS) = 41919.01

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24543.04	15.17	2.986	0.30 ( 0.30)	0.99	4493.5	40510.00
2	24838.76	16.57	2.834	0.30 ( 0.30)	0.99	4947.8	40500.00
3	26141.36	19.66	2.501	0.30 ( 0.30)	0.99	5942.0	40430.00
4	26209.15	19.91	2.474	0.30 ( 0.30)	0.99	6021.8	31700.00
5	26266.47	20.09	2.458	0.30 ( 0.30)	0.99	6085.7	40600.00
6	26300.38	20.20	2.450	0.30 ( 0.30)	0.99	6124.1	40440.00
7	26625.44	21.30	2.377	0.30 ( 0.30)	0.99	6494.9	40400.00
8	26681.34	21.49	2.364	0.30 ( 0.30)	0.99	6559.1	40420.00
9	26692.13	21.52	2.362	0.30 ( 0.30)	0.99	6571.5	40410.00
10	26771.44	21.80	2.343	0.30 ( 0.30)	0.99	6664.1	31800.00
11	26859.79	22.10	2.323	0.30 ( 0.30)	0.99	6772.8	40300.00
12	27205.09	23.28	2.244	0.30 ( 0.30)	0.99	7193.6	31710.00
13	27212.39	23.30	2.242	0.30 ( 0.30)	0.99	7202.6	40200.00
14	27629.68	25.19	2.119	0.30 ( 0.30)	0.99	7939.3	31810.00
15	30464.06	36.93	1.723	0.30 ( 0.30)	0.99	12490.2	40100.00
16	32609.25	43.45	1.566	0.30 ( 0.30)	0.99	14881.1	11831.00
17	33363.13	45.95	1.510	0.30 ( 0.30)	0.99	15834.5	11801.00
18	36286.57	55.78	1.361	0.30 ( 0.30)	0.99	20129.9	11530.00
19	38630.17	64.56	1.289	0.30 ( 0.30)	0.99	25113.8	11910.00
20	40809.73	71.89	1.240	0.30 ( 0.30)	0.99	29719.9	11330.00
21	41919.01	78.33	1.197	0.30 ( 0.30)	0.99	34150.3	11130.00
22	41846.93	85.91	1.146	0.30 ( 0.30)	0.99	38140.5	12330.00
23	41796.92	88.50	1.129	0.30 ( 0.30)	0.99	39557.6	12410.00
24	41626.00	92.53	1.108	0.30 ( 0.30)	0.99	41483.6	12400.00
25	41131.57	101.14	1.069	0.30 ( 0.30)	0.99	44850.9	12201.00
26	40688.04	105.05	1.051	0.30 ( 0.30)	0.99	45937.2	12111.00
27	40398.48	107.42	1.040	0.30 ( 0.30)	0.99	46577.5	10700.00
28	40063.58	110.35	1.027	0.30 ( 0.30)	0.99	47306.6	12101.10
29	39553.48	114.32	1.009	0.30 ( 0.30)	0.99	48157.3	10400.00
30	38039.84	122.14	0.977	0.30 ( 0.30)	0.99	49469.4	12010.00
31	36749.20	127.88	0.962	0.30 ( 0.30)	0.99	49786.0	10210.00
32	36390.49	130.46	0.956	0.30 ( 0.30)	0.99	49894.9	12000.00
33	33376.27	153.48	0.895	0.30 ( 0.30)	0.99	50518.0	10100.00

=====  
 END OF RATIONAL METHOD ANALYSIS  
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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

Michael Baker International  
5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

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FILE NAME: S27.DAT  
TIME/DATE OF STUDY: 08:14 07/16/2018  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.035
- 2) 10.00; 3.868
- 3) 15.00; 2.984
- 4) 20.00; 2.451
- 5) 25.00; 2.119
- 6) 30.00; 1.892
- 7) 40.00; 1.636
- 8) 50.00; 1.413
- 9) 60.00; 1.311
- 10) 90.00; 1.110
- 11) 120.00; 0.974
- 12) 180.00; 0.817
- 13) 360.00; 0.608
- 14) 1200.00; 0.267

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 12606.00 TO NODE 12606.00 IS CODE = 15.1

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>>>>DEFINE MEMORY BANK # 1 <<<<<<  
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PEAK FLOWRATE TABLE FILE NAME: S26.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24838.76	16.57	0.30 ( 0.30)	0.99	4947.8	40500.00
2	26300.38	20.20	0.30 ( 0.30)	0.99	6124.1	40440.00
3	27629.68	25.19	0.30 ( 0.30)	0.99	7939.3	31810.00
4	30464.06	36.93	0.30 ( 0.30)	0.99	12490.2	40100.00
5	33363.13	45.95	0.30 ( 0.30)	0.99	15834.5	11801.00
6	36286.57	55.78	0.30 ( 0.30)	0.99	20129.9	11530.00
7	38630.17	64.56	0.30 ( 0.30)	0.99	25113.8	11910.00
8	40809.73	71.89	0.30 ( 0.30)	0.99	29719.9	11330.00
9	41919.01	78.33	0.30 ( 0.30)	0.99	34150.3	11130.00
10	41846.93	85.91	0.30 ( 0.30)	0.99	38140.5	12330.00
11	41796.92	88.50	0.30 ( 0.30)	0.99	39557.6	12410.00
12	41626.00	92.53	0.30 ( 0.30)	0.99	41483.6	12400.00
13	41131.57	101.14	0.30 ( 0.30)	0.99	44850.9	12201.00
14	40688.04	105.05	0.30 ( 0.30)	0.99	45937.2	12111.00
15	40063.58	110.35	0.30 ( 0.30)	0.99	47306.6	12101.10
16	39553.48	114.32	0.30 ( 0.30)	0.99	48157.3	10400.00
17	38039.84	122.14	0.30 ( 0.30)	0.99	49469.4	12010.00
18	36749.20	127.88	0.30 ( 0.30)	0.99	49786.0	10210.00
19	36390.49	130.46	0.30 ( 0.30)	0.99	49894.9	12000.00
20	33376.27	153.48	0.30 ( 0.30)	0.99	50518.0	10100.00
TOTAL AREA (ACRES) =						50518.0

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FLOW PROCESS FROM NODE 12606.00 TO NODE 12606.00 IS CODE = 14.0

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>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
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MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24838.76	16.57	0.30 ( 0.30)	0.99	4947.8	40500.00
2	26300.38	20.20	0.30 ( 0.30)	0.99	6124.1	40440.00
3	27629.68	25.19	0.30 ( 0.30)	0.99	7939.3	31810.00
4	30464.06	36.93	0.30 ( 0.30)	0.99	12490.2	40100.00
5	33363.13	45.95	0.30 ( 0.30)	0.99	15834.5	11801.00
6	36286.57	55.78	0.30 ( 0.30)	0.99	20129.9	11530.00
7	38630.17	64.56	0.30 ( 0.30)	0.99	25113.8	11910.00
8	40809.73	71.89	0.30 ( 0.30)	0.99	29719.9	11330.00
9	41919.01	78.33	0.30 ( 0.30)	0.99	34150.3	11130.00
10	41846.93	85.91	0.30 ( 0.30)	0.99	38140.5	12330.00
11	41796.92	88.50	0.30 ( 0.30)	0.99	39557.6	12410.00
12	41626.00	92.53	0.30 ( 0.30)	0.99	41483.6	12400.00
13	41131.57	101.14	0.30 ( 0.30)	0.99	44850.9	12201.00
14	40688.04	105.05	0.30 ( 0.30)	0.99	45937.2	12111.00
15	40063.58	110.35	0.30 ( 0.30)	0.99	47306.6	12101.10
16	39553.48	114.32	0.30 ( 0.30)	0.99	48157.3	10400.00
17	38039.84	122.14	0.30 ( 0.30)	0.99	49469.4	12010.00
18	36749.20	127.88	0.30 ( 0.30)	0.99	49786.0	10210.00

19 36390.49 130.46 0.30( 0.30) 0.99 49894.9 12000.00  
20 33376.27 153.48 0.30( 0.30) 0.99 50518.0 10100.00  
TOTAL AREA(ACRES) = 50518.0

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FLOW PROCESS FROM NODE 12606.00 TO NODE 12701.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 286.00 DOWNSTREAM(FEET) = 276.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1260.19 CHANNEL SLOPE = 0.0079  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 9.59

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.180

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	7.55	0.30	0.889	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.889

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 41922.12

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 17.62

AVERAGE FLOW DEPTH(FEET) = 9.59 TRAVEL TIME(MIN.) = 1.19

Tc(MIN.) = 79.53

SUBAREA AREA(ACRES) = 7.55 SUBAREA RUNOFF(CFS) = 6.21

EFFECTIVE AREA(ACRES) = 34157.85 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99

TOTAL AREA(ACRES) = 50525.6 PEAK FLOW RATE(CFS) = 41919.01

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 9.59

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 9.59 FLOW VELOCITY(FEET/SEC.) = 17.62

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12701.00 = 105865.19 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24838.76	17.99	2.665	0.30( 0.30)	0.99	4955.4	40500.00
2	26300.38	21.59	2.345	0.30( 0.30)	0.99	6131.6	40440.00
3	27629.68	26.55	2.048	0.30( 0.30)	0.99	7946.8	31810.00
4	30464.06	38.26	1.681	0.30( 0.30)	0.99	12497.8	40100.00
5	33363.13	47.23	1.475	0.30( 0.30)	0.99	15842.1	11801.00
6	36286.57	57.03	1.341	0.30( 0.30)	0.99	20137.5	11530.00
7	38630.17	65.78	1.272	0.30( 0.30)	0.99	25121.3	11910.00
8	40809.73	73.10	1.223	0.30( 0.30)	0.99	29727.5	11330.00
9	41919.01	79.53	1.180	0.30( 0.30)	0.99	34157.9	11130.00
10	41846.93	87.10	1.129	0.30( 0.30)	0.99	38148.1	12330.00
11	41796.92	89.70	1.112	0.30( 0.30)	0.99	39565.1	12410.00
12	41626.00	93.72	1.093	0.30( 0.30)	0.99	41491.1	12400.00
13	41131.57	102.34	1.054	0.30( 0.30)	0.99	44858.5	12201.00
14	40688.04	106.25	1.036	0.30( 0.30)	0.99	45944.8	12111.00
15	40063.58	111.56	1.012	0.30( 0.30)	0.99	47314.1	12101.10
16	39553.48	115.53	0.994	0.30( 0.30)	0.99	48164.9	10400.00

17 38039.84 123.37 0.965 0.30( 0.30) 0.99 49477.0 12010.00  
18 36749.20 129.12 0.950 0.30( 0.30) 0.99 49793.5 10210.00  
19 36390.49 131.71 0.943 0.30( 0.30) 0.99 49902.5 12000.00  
20 33376.27 154.77 0.883 0.30( 0.30) 0.99 50525.6 10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 41919.01 Tc(MIN.) = 79.53

AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 34157.85

\*\*\*\*\*

FLOW PROCESS FROM NODE 12701.00 TO NODE 12720.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 276.00 DOWNSTREAM(FEET) = 275.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 147.65 CHANNEL SLOPE = 0.0068  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.03

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.179

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	1.49	0.30	0.972	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.972

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 41919.61

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 16.71

AVERAGE FLOW DEPTH(FEET) = 10.03 TRAVEL TIME(MIN.) = 0.15

Tc(MIN.) = 79.67

SUBAREA AREA(ACRES) = 1.49 SUBAREA RUNOFF(CFS) = 1.19

EFFECTIVE AREA(ACRES) = 34159.34 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99

TOTAL AREA(ACRES) = 50527.1 PEAK FLOW RATE(CFS) = 41919.01

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.03

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 10.03 FLOW VELOCITY(FEET/SEC.) = 16.71

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.00 = 106012.84 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24838.76	18.17	2.646	0.30( 0.30)	0.99	4956.9	40500.00
2	26300.38	21.77	2.334	0.30( 0.30)	0.99	6133.1	40440.00
3	27629.68	26.72	2.041	0.30( 0.30)	0.99	7948.3	31810.00
4	30464.06	38.42	1.676	0.30( 0.30)	0.99	12499.3	40100.00
5	33363.13	47.39	1.471	0.30( 0.30)	0.99	15843.6	11801.00
6	36286.57	57.18	1.340	0.30( 0.30)	0.99	20139.0	11530.00
7	38630.17	65.93	1.271	0.30( 0.30)	0.99	25122.8	11910.00
8	40809.73	73.24	1.222	0.30( 0.30)	0.99	29729.0	11330.00
9	41919.01	79.67	1.179	0.30( 0.30)	0.99	34159.3	11130.00
10	41846.93	87.25	1.128	0.30( 0.30)	0.99	38149.6	12330.00
11	41796.92	89.84	1.111	0.30( 0.30)	0.99	39566.6	12410.00

12	41626.00	93.87	1.092	0.30	( 0.30)	0.99	41492.6	12400.00
13	41131.57	102.49	1.053	0.30	( 0.30)	0.99	44860.0	12201.00
14	40688.04	106.40	1.036	0.30	( 0.30)	0.99	45946.3	12111.00
15	40063.58	111.71	1.012	0.30	( 0.30)	0.99	47315.6	12101.10
16	39553.48	115.68	0.994	0.30	( 0.30)	0.99	48166.4	10400.00
17	38039.84	123.52	0.965	0.30	( 0.30)	0.99	49478.5	12010.00
18	36749.20	129.27	0.950	0.30	( 0.30)	0.99	49795.0	10210.00
19	36390.49	131.86	0.943	0.30	( 0.30)	0.99	49904.0	12000.00
20	33376.27	154.92	0.883	0.30	( 0.30)	0.99	50527.1	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 41919.01 Tc(MIN.) = 79.67  
 AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 34159.34

\*\*\*\*\*

FLOW PROCESS FROM NODE 12701.00 TO NODE 12720.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 79.67  
 RAINFALL INTENSITY(INCH/HR) = 1.18  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.99  
 EFFECTIVE STREAM AREA(ACRES) = 34159.34  
 TOTAL STREAM AREA(ACRES) = 50527.07  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 41919.01

\*\*\*\*\*

FLOW PROCESS FROM NODE 12710.00 TO NODE 12711.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 943.56  
 ELEVATION DATA: UPSTREAM(FEET) = 940.78 DOWNSTREAM(FEET) = 657.79

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.910  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.177  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "GRASS"	-	6.56	0.30	1.000	0	13.91

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 16.99  
 TOTAL AREA(ACRES) = 6.56 PEAK FLOW RATE(CFS) = 16.99

\*\*\*\*\*

FLOW PROCESS FROM NODE 12711.00 TO NODE 12712.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 657.79 DOWNSTREAM(FEET) = 585.63  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 766.00 CHANNEL SLOPE = 0.0942  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.78  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.859

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	26.94	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 48.08  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.64  
 AVERAGE FLOW DEPTH(FEET) = 0.74 TRAVEL TIME(MIN.) = 2.27  
 Tc(MIN.) = 16.18  
 SUBAREA AREA(ACRES) = 26.94 SUBAREA RUNOFF(CFS) = 62.04  
 EFFECTIVE AREA(ACRES) = 33.50 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 33.5 PEAK FLOW RATE(CFS) = 77.15  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.97

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.97 FLOW VELOCITY(FEET/SEC.) = 6.63  
 LONGEST FLOWPATH FROM NODE 12710.00 TO NODE 12712.00 = 1709.56 FEET.

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FLOW PROCESS FROM NODE 12712.00 TO NODE 12713.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 585.63 DOWNSTREAM(FEET) = 463.75  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1025.79 CHANNEL SLOPE = 0.1188  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.03  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.619  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	14.73	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 92.52  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.60  
 AVERAGE FLOW DEPTH(FEET) = 1.01 TRAVEL TIME(MIN.) = 2.25  
 Tc(MIN.) = 18.42  
 SUBAREA AREA(ACRES) = 14.73 SUBAREA RUNOFF(CFS) = 30.75  
 EFFECTIVE AREA(ACRES) = 48.23 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 48.2 PEAK FLOW RATE(CFS) = 100.67  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.06



END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.06 FLOW VELOCITY(FEET/SEC.) = 7.81  
LONGEST FLOWPATH FROM NODE 12710.00 TO NODE 12713.00 = 2735.35 FEET.

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FLOW PROCESS FROM NODE 12713.00 TO NODE 12714.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 463.75 DOWNSTREAM(FEET) = 360.30  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1148.54 CHANNEL SLOPE = 0.0901  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.74

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.412

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	105.64	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 201.16

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.84

AVERAGE FLOW DEPTH(FEET) = 1.70 TRAVEL TIME(MIN.) = 2.17

Tc(MIN.) = 20.59

SUBAREA AREA(ACRES) = 105.64 SUBAREA RUNOFF(CFS) = 200.80

EFFECTIVE AREA(ACRES) = 153.87 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 153.9 PEAK FLOW RATE(CFS) = 292.48

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.09

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.09 FLOW VELOCITY(FEET/SEC.) = 9.88

LONGEST FLOWPATH FROM NODE 12710.00 TO NODE 12714.00 = 3883.89 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12714.00 TO NODE 12720.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 360.30 DOWNSTREAM(FEET) = 275.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1314.99 CHANNEL SLOPE = 0.0649  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.75

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.261

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	127.13	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 404.72

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.64

AVERAGE FLOW DEPTH(FEET) = 2.72 TRAVEL TIME(MIN.) = 2.27

Tc(MIN.) = 22.86

SUBAREA AREA(ACRES) = 127.13 SUBAREA RUNOFF(CFS) = 224.38

EFFECTIVE AREA(ACRES) = 281.00 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 281.0 PEAK FLOW RATE(CFS) = 495.95

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.02

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.02 FLOW VELOCITY(FEET/SEC.) = 10.22

LONGEST FLOWPATH FROM NODE 12710.00 TO NODE 12720.00 = 5198.88 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12714.00 TO NODE 12720.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 22.86

RAINFALL INTENSITY(INCH/HR) = 2.26

AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA(ACRES) = 281.00

TOTAL STREAM AREA(ACRES) = 281.00

PEAK FLOW RATE(CFS) AT CONFLUENCE = 495.95

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24838.76	18.17	2.646	0.30( 0.30)	0.99	4956.9	40500.00
1	26300.38	21.77	2.334	0.30( 0.30)	0.99	6133.1	40440.00
1	27629.68	26.72	2.041	0.30( 0.30)	0.99	7948.3	31810.00
1	30464.06	38.42	1.676	0.30( 0.30)	0.99	12499.3	40100.00
1	33363.13	47.39	1.471	0.30( 0.30)	0.99	15843.6	11801.00
1	36286.57	57.18	1.340	0.30( 0.30)	0.99	20139.0	11530.00
1	38630.17	65.93	1.271	0.30( 0.30)	0.99	25122.8	11910.00
1	40809.73	73.24	1.222	0.30( 0.30)	0.99	29729.0	11330.00
1	41919.01	79.67	1.179	0.30( 0.30)	0.99	34159.3	11130.00
1	41846.93	87.25	1.128	0.30( 0.30)	0.99	38149.6	12330.00
1	41796.92	89.84	1.111	0.30( 0.30)	0.99	39566.6	12410.00
1	41626.00	93.87	1.092	0.30( 0.30)	0.99	41492.6	12400.00
1	41131.57	102.49	1.053	0.30( 0.30)	0.99	44860.0	12201.00
1	40688.04	106.40	1.036	0.30( 0.30)	0.99	45946.3	12111.00
1	40063.58	111.71	1.012	0.30( 0.30)	0.99	47315.6	12101.10
1	39553.48	115.68	0.994	0.30( 0.30)	0.99	48166.4	10400.00
1	38039.84	123.52	0.965	0.30( 0.30)	0.99	49478.5	12010.00
1	36749.20	129.27	0.950	0.30( 0.30)	0.99	49795.0	10210.00
1	36390.49	131.86	0.943	0.30( 0.30)	0.99	49904.0	12000.00
1	33376.27	154.92	0.883	0.30( 0.30)	0.99	50527.1	10100.00
2	495.95	22.86	2.261	0.30( 0.30)	1.00	281.0	12710.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 21 rows of data.

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 42141.38 Tc(MIN.) = 79.67
EFFECTIVE AREA(ACRES) = 34440.34 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 50808.1
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.00 = 106012.84 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<<

\*\*\*MEMORY BANK # 2 IS EMPTY - PROCESS IGNORED.\*\*\*

\*\*\*\*\*
FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610316Y.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 1 row of data.

\*\*\*\*\*
FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 21 rows of data and a summary line: LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.00 = 106012.84 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 1 row of data and a summary line: LONGEST FLOWPATH FROM NODE 31600.00 TO NODE 12720.00 = 7759.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 21 rows of data.

TOTAL AREA(ACRES) = 51039.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 42325.80 Tc(MIN.) = 79.673
EFFECTIVE AREA(ACRES) = 34671.73 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 51039.5
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.00 = 106012.84 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.50 IS CODE = 56
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 275.00 DOWNSTREAM(FEET) = 258.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 2669.21 CHANNEL SLOPE = 0.0064
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.26
CHANNEL FLOW THRU SUBAREA(CFS) = 42325.80
FLOW VELOCITY(FEET/SEC.) = 16.42 FLOW DEPTH(FEET) = 10.26
TRAVEL TIME(MIN.) = 2.71 Tc(MIN.) = 82.38
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.50 = 108682.05 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 22 rows of data.

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 42325.80 Tc(MIN.) = 82.38
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 34671.73

\*\*\*\*\*
FLOW PROCESS FROM NODE 12720.50 TO NODE 12720.50 IS CODE = 12
-----

>>>>CLEAR MEMORY BANK # 2 <<<<

\*\*\*\*\*
FLOW PROCESS FROM NODE 12720.50 TO NODE 12720.50 IS CODE = 15.1
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>>>>DEFINE MEMORY BANK # 2 <<<<

PEAK FLOWRATE TABLE FILE NAME: 0610315Y.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

Table with 7 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 1 row of data.

\*\*\*\*\*
FLOW PROCESS FROM NODE 12720.50 TO NODE 12720.50 IS CODE = 11
-----

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 22 rows of data.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

Table with 7 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 1 row of data.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 2 rows of data.

3	27275.72	24.90	2.126	0.30	( 0.30)	0.99	6670.2	40440.00
4	27577.35	25.98	2.074	0.30	( 0.30)	0.99	7095.0	12710.00
5	28118.38	28.10	1.978	0.30	( 0.30)	0.99	7896.2	31600.00
6	28535.59	29.81	1.901	0.30	( 0.30)	0.99	8528.8	31810.00
7	31183.66	41.42	1.604	0.30	( 0.30)	0.99	13079.8	40100.00
8	33976.06	50.30	1.410	0.30	( 0.30)	0.99	16424.1	11801.00
9	36832.73	60.02	1.311	0.30	( 0.30)	0.99	20719.5	11530.00
10	39141.14	68.71	1.253	0.30	( 0.30)	0.99	25703.3	11910.00
11	41295.11	75.98	1.204	0.30	( 0.30)	0.99	30309.5	11330.00
12	42381.88	82.38	1.161	0.30	( 0.30)	0.99	34739.8	11130.00
13	42283.26	89.96	1.110	0.30	( 0.30)	0.99	38730.1	12330.00
14	42224.50	92.56	1.098	0.30	( 0.30)	0.99	40147.1	12410.00
15	42043.87	96.58	1.080	0.30	( 0.30)	0.99	42073.1	12400.00
16	41529.01	105.21	1.041	0.30	( 0.30)	0.99	45440.5	12201.00
17	41076.19	109.14	1.023	0.30	( 0.30)	0.99	46526.7	12111.00
18	40439.15	114.46	0.999	0.30	( 0.30)	0.99	47896.1	12101.10
19	39919.63	118.44	0.981	0.30	( 0.30)	0.99	48746.9	10400.00
20	38391.25	126.32	0.957	0.30	( 0.30)	0.99	50059.0	12010.00
21	37092.73	132.10	0.942	0.30	( 0.30)	0.99	50375.5	10210.00
22	36730.48	134.70	0.936	0.30	( 0.30)	0.99	50484.4	12000.00
23	33684.69	157.84	0.875	0.30	( 0.30)	0.99	51107.6	10100.00

TOTAL AREA (ACRES) = 51107.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 42381.88 Tc (MIN.) = 82.382  
EFFECTIVE AREA (ACRES) = 34739.83 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 51107.6  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.50 = 108682.05 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12720.50 TO NODE 12721.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 258.00 DOWNSTREAM (FEET) = 256.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 438.77 CHANNEL SLOPE = 0.0046  
GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT (FEET) = 11.28

\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.158

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	62.15	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 42405.86

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 14.66

AVERAGE FLOW DEPTH (FEET) = 11.28 TRAVEL TIME (MIN.) = 0.50

Tc (MIN.) = 82.88

SUBAREA AREA (ACRES) = 62.15 SUBAREA RUNOFF (CFS) = 47.98

EFFECTIVE AREA (ACRES) = 34801.98 AREA-AVERAGED Fm (INCH/HR) = 0.30

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99

TOTAL AREA (ACRES) = 51169.7 PEAK FLOW RATE (CFS) = 42381.88

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT (FEET) = 11.27

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 11.27 FLOW VELOCITY (FEET/SEC.) = 14.66

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12721.00 = 109120.82 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25784.42	21.95	2.322	0.30 ( 0.30)	0.99	5472.2	40500.00
2	26718.97	24.15	2.176	0.30 ( 0.30)	0.99	6260.5	31500.00
3	27275.72	25.48	2.097	0.30 ( 0.30)	0.99	6732.4	40440.00
4	27577.35	26.56	2.048	0.30 ( 0.30)	0.99	7157.2	12710.00
5	28118.38	28.67	1.952	0.30 ( 0.30)	0.99	7958.3	31600.00
6	28535.59	30.38	1.882	0.30 ( 0.30)	0.99	8591.0	31810.00
7	31183.66	41.97	1.592	0.30 ( 0.30)	0.99	13141.9	40100.00
8	33976.06	50.84	1.404	0.30 ( 0.30)	0.99	16486.2	11801.00
9	36832.73	60.54	1.307	0.30 ( 0.30)	0.99	20781.6	11530.00
10	39141.14	69.23	1.249	0.30 ( 0.30)	0.99	25765.4	11910.00
11	41295.11	76.48	1.201	0.30 ( 0.30)	0.99	30371.6	11330.00
12	42381.88	82.88	1.158	0.30 ( 0.30)	0.99	34802.0	11130.00
13	42283.26	90.46	1.108	0.30 ( 0.30)	0.99	38792.2	12330.00
14	42224.50	93.05	1.096	0.30 ( 0.30)	0.99	40209.2	12410.00
15	42043.87	97.08	1.078	0.30 ( 0.30)	0.99	42135.3	12400.00
16	41529.01	105.71	1.039	0.30 ( 0.30)	0.99	45502.6	12201.00
17	41076.19	109.64	1.021	0.30 ( 0.30)	0.99	46588.9	12111.00
18	40439.15	114.97	0.997	0.30 ( 0.30)	0.99	47958.3	12101.10
19	39919.63	118.95	0.979	0.30 ( 0.30)	0.99	48809.0	10400.00
20	38391.25	126.83	0.956	0.30 ( 0.30)	0.99	50121.1	12010.00
21	37092.73	132.62	0.941	0.30 ( 0.30)	0.99	50437.7	10210.00
22	36730.48	135.23	0.934	0.30 ( 0.30)	0.99	50546.6	12000.00
23	33684.69	158.38	0.874	0.30 ( 0.30)	0.99	51169.7	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 42381.88 Tc (MIN.) = 82.88

AREA-AVERAGED Fm (INCH/HR) = 0.30 AREA-AVERAGED Fp (INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA (ACRES) = 34801.98

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12721.00 TO NODE 12722.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 256.00 DOWNSTREAM (FEET) = 255.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 830.42 CHANNEL SLOPE = 0.0012  
GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT (FEET) = 16.27

\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.148

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	11.24	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 42386.16

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.26

AVERAGE FLOW DEPTH(FEET) = 16.27 TRAVEL TIME(MIN.) = 1.49  
 Tc(MIN.) = 84.38  
 SUBAREA AREA(ACRES) = 11.24 SUBAREA RUNOFF(CFS) = 8.58  
 EFFECTIVE AREA(ACRES) = 34813.22 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 51180.9 PEAK FLOW RATE(CFS) = 42381.88  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 16.26

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 16.26 FLOW VELOCITY(FEET/SEC.) = 9.26  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12722.00 = 109951.24 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25784.42	23.69	2.206	0.30( 0.30)	0.99	5483.4	40500.00
2	26718.97	25.87	2.080	0.30( 0.30)	0.99	6271.7	31500.00
3	27275.72	27.19	2.020	0.30( 0.30)	0.99	6743.6	40440.00
4	27577.35	28.26	1.971	0.30( 0.30)	0.99	7168.4	12710.00
5	28118.38	30.36	1.883	0.30( 0.30)	0.99	7969.6	31600.00
6	28535.59	32.06	1.839	0.30( 0.30)	0.99	8602.2	31810.00
7	31183.66	43.61	1.556	0.30( 0.30)	0.99	13153.2	40100.00
8	33976.06	52.44	1.388	0.30( 0.30)	0.99	16497.5	11801.00
9	36832.73	62.10	1.297	0.30( 0.30)	0.99	20792.9	11530.00
10	39141.14	70.76	1.239	0.30( 0.30)	0.99	25776.7	11910.00
11	41295.11	77.99	1.190	0.30( 0.30)	0.99	30382.9	11330.00
12	42381.88	84.38	1.148	0.30( 0.30)	0.99	34813.2	11130.00
13	42283.26	91.95	1.101	0.30( 0.30)	0.99	38803.4	12330.00
14	42224.50	94.55	1.089	0.30( 0.30)	0.99	40220.5	12410.00
15	42043.87	98.58	1.071	0.30( 0.30)	0.99	42146.5	12400.00
16	41529.01	107.22	1.032	0.30( 0.30)	0.99	45513.9	12201.00
17	41076.19	111.15	1.014	0.30( 0.30)	0.99	46600.1	12111.00
18	40439.15	116.48	0.990	0.30( 0.30)	0.99	47969.5	12101.10
19	39919.63	120.47	0.973	0.30( 0.30)	0.99	48820.2	10400.00
20	38391.25	128.37	0.952	0.30( 0.30)	0.99	50132.4	12010.00
21	37092.73	134.18	0.937	0.30( 0.30)	0.99	50448.9	10210.00
22	36730.48	136.79	0.930	0.30( 0.30)	0.99	50557.8	12000.00
23	33684.69	159.98	0.869	0.30( 0.30)	0.99	51180.9	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 42381.88 Tc(MIN.) = 84.38  
 AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 34813.22

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12722.00 TO NODE 12722.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610314Y.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	650.23	35.65	0.30( 0.30)	0.99	497.2	31400.00
TOTAL AREA(ACRES) = 497.2						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12722.00 TO NODE 12722.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25784.42	23.69	2.206	0.30( 0.30)	0.99	5483.4	40500.00
2	26718.97	25.87	2.080	0.30( 0.30)	0.99	6271.7	31500.00
3	27275.72	27.19	2.020	0.30( 0.30)	0.99	6743.6	40440.00
4	27577.35	28.26	1.971	0.30( 0.30)	0.99	7168.4	12710.00
5	28118.38	30.36	1.883	0.30( 0.30)	0.99	7969.6	31600.00
6	28535.59	32.06	1.839	0.30( 0.30)	0.99	8602.2	31810.00
7	31183.66	43.61	1.556	0.30( 0.30)	0.99	13153.2	40100.00
8	33976.06	52.44	1.388	0.30( 0.30)	0.99	16497.5	11801.00
9	36832.73	62.10	1.297	0.30( 0.30)	0.99	20792.9	11530.00
10	39141.14	70.76	1.239	0.30( 0.30)	0.99	25776.7	11910.00
11	41295.11	77.99	1.190	0.30( 0.30)	0.99	30382.9	11330.00
12	42381.88	84.38	1.148	0.30( 0.30)	0.99	34813.2	11130.00
13	42283.26	91.95	1.101	0.30( 0.30)	0.99	38803.4	12330.00
14	42224.50	94.55	1.089	0.30( 0.30)	0.99	40220.5	12410.00
15	42043.87	98.58	1.071	0.30( 0.30)	0.99	42146.5	12400.00
16	41529.01	107.22	1.032	0.30( 0.30)	0.99	45513.9	12201.00
17	41076.19	111.15	1.014	0.30( 0.30)	0.99	46600.1	12111.00
18	40439.15	116.48	0.990	0.30( 0.30)	0.99	47969.5	12101.10
19	39919.63	120.47	0.973	0.30( 0.30)	0.99	48820.2	10400.00
20	38391.25	128.37	0.952	0.30( 0.30)	0.99	50132.4	12010.00
21	37092.73	134.18	0.937	0.30( 0.30)	0.99	50448.9	10210.00
22	36730.48	136.79	0.930	0.30( 0.30)	0.99	50557.8	12000.00
23	33684.69	159.98	0.869	0.30( 0.30)	0.99	51180.9	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12722.00 = 109951.24 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	650.23	35.65	1.747	0.30( 0.30)	0.99	497.2	31400.00

LONGEST FLOWPATH FROM NODE 31400.00 TO NODE 12722.00 = 14614.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26353.12	23.69	2.206	0.30( 0.30)	0.99	5813.8	40500.00
2	27298.86	25.87	2.080	0.30( 0.30)	0.99	6632.5	31500.00
3	27864.69	27.19	2.020	0.30( 0.30)	0.99	7122.8	40440.00
4	28172.27	28.26	1.971	0.30( 0.30)	0.99	7562.5	12710.00
5	28723.84	30.36	1.883	0.30( 0.30)	0.99	8393.0	31600.00
6	29157.42	32.06	1.839	0.30( 0.30)	0.99	9049.4	31810.00
7	30008.82	35.65	1.747	0.30( 0.30)	0.99	10513.8	31400.00
8	31747.91	43.61	1.556	0.30( 0.30)	0.99	13650.4	40100.00
9	34465.26	52.44	1.388	0.30( 0.30)	0.99	16994.7	11801.00
10	37281.02	62.10	1.297	0.30( 0.30)	0.99	21290.1	11530.00
11	39563.45	70.76	1.239	0.30( 0.30)	0.99	26273.9	11910.00
12	41695.69	77.99	1.190	0.30( 0.30)	0.99	30880.1	11330.00
13	42763.27	84.38	1.148	0.30( 0.30)	0.99	35310.4	11130.00
14	42643.79	91.95	1.101	0.30( 0.30)	0.99	39300.6	12330.00
15	42579.74	94.55	1.089	0.30( 0.30)	0.99	40717.7	12410.00

16	42390.92	98.58	1.071	0.30	( 0.30)	0.99	42643.7	12400.00
17	41858.51	107.22	1.032	0.30	( 0.30)	0.99	46011.1	12201.00
18	41397.70	111.15	1.014	0.30	( 0.30)	0.99	47097.3	12111.00
19	40749.82	116.48	0.990	0.30	( 0.30)	0.99	48466.7	12101.10
20	40222.59	120.47	0.973	0.30	( 0.30)	0.99	49317.4	10400.00
21	38684.95	128.37	0.952	0.30	( 0.30)	0.99	50629.5	12010.00
22	37379.62	134.18	0.937	0.30	( 0.30)	0.99	50946.1	10210.00
23	37014.31	136.79	0.930	0.30	( 0.30)	0.99	51055.0	12000.00
24	33941.30	159.98	0.869	0.30	( 0.30)	0.99	51678.1	10100.00

TOTAL AREA (ACRES) = 51678.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 42763.27 Tc (MIN.) = 84.376  
EFFECTIVE AREA (ACRES) = 35310.41 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 51678.1  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12722.00 = 109951.24 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12722.00 TO NODE 12740.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 255.00 DOWNSTREAM (FEET) = 252.10  
CHANNEL LENGTH THRU SUBAREA (FEET) = 624.00 CHANNEL SLOPE = 0.0046  
GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 11.28  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.143

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	62.42	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 42786.95  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 14.80  
AVERAGE FLOW DEPTH (FEET) = 11.27 TRAVEL TIME (MIN.) = 0.70  
Tc (MIN.) = 85.08  
SUBAREA AREA (ACRES) = 62.42 SUBAREA RUNOFF (CFS) = 47.36  
EFFECTIVE AREA (ACRES) = 35372.84 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 51740.6 PEAK FLOW RATE (CFS) = 42763.27

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 11.27

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 11.27 FLOW VELOCITY (FEET/SEC.) = 14.80  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12740.00 = 110575.24 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26353.12	24.51	2.152	0.30 ( 0.30)	0.99	5876.2	40500.00
2	27298.86	26.68	2.043	0.30 ( 0.30)	0.99	6694.9	31500.00

3	27864.69	27.99	1.983	0.30	( 0.30)	0.99	7185.2	40440.00
4	28172.27	29.07	1.934	0.30	( 0.30)	0.99	7625.0	12710.00
5	28723.84	31.16	1.862	0.30	( 0.30)	0.99	8455.4	31600.00
6	29157.42	32.86	1.819	0.30	( 0.30)	0.99	9111.8	31810.00
7	30008.82	36.44	1.727	0.30	( 0.30)	0.99	10576.2	31400.00
8	31747.91	44.38	1.538	0.30	( 0.30)	0.99	13712.8	40100.00
9	34465.26	53.19	1.380	0.30	( 0.30)	0.99	17057.1	11801.00
10	37281.02	62.84	1.292	0.30	( 0.30)	0.99	21352.5	11530.00
11	39563.45	71.48	1.234	0.30	( 0.30)	0.99	26336.3	11910.00
12	41695.69	78.70	1.186	0.30	( 0.30)	0.99	30942.5	11330.00
13	42763.27	85.08	1.143	0.30	( 0.30)	0.99	35372.8	11130.00
14	42643.79	92.65	1.098	0.30	( 0.30)	0.99	39363.1	12330.00
15	42579.74	95.25	1.086	0.30	( 0.30)	0.99	40780.1	12410.00
16	42390.92	99.29	1.068	0.30	( 0.30)	0.99	42706.1	12400.00
17	41858.51	107.93	1.029	0.30	( 0.30)	0.99	46073.5	12201.00
18	41397.70	111.86	1.011	0.30	( 0.30)	0.99	47159.8	12111.00
19	40749.82	117.19	0.987	0.30	( 0.30)	0.99	48529.1	12101.10
20	40222.59	121.19	0.971	0.30	( 0.30)	0.99	49379.9	10400.00
21	38684.95	129.10	0.950	0.30	( 0.30)	0.99	50692.0	12010.00
22	37379.62	134.91	0.935	0.30	( 0.30)	0.99	51008.5	10210.00
23	37014.31	137.52	0.928	0.30	( 0.30)	0.99	51117.5	12000.00
24	33941.30	160.74	0.867	0.30	( 0.30)	0.99	51740.6	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 42763.27 Tc (MIN.) = 85.08  
AREA-AVERAGED Fm (INCH/HR) = 0.30 AREA-AVERAGED Fp (INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA (ACRES) = 35372.84

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12722.00 TO NODE 12740.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION (MIN.) = 85.08  
RAINFALL INTENSITY (INCH/HR) = 1.14  
AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.99  
EFFECTIVE STREAM AREA (ACRES) = 35372.84  
TOTAL STREAM AREA (ACRES) = 51740.56  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 42763.27

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12730.00 TO NODE 12731.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH (FEET) = 561.54  
ELEVATION DATA: UPSTREAM (FEET) = 613.29 DOWNSTREAM (FEET) = 551.75

Tc = K \* [(LENGTH\*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20  
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 13.823  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.192  
SUBAREA Tc AND LOSS RATE DATA (AMC II):

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

NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 6.33 0.30 1.000 0 13.82  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 16.48  
TOTAL AREA (ACRES) = 6.33 PEAK FLOW RATE (CFS) = 16.48

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12731.00 TO NODE 12732.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 551.75 DOWNSTREAM(FEET) = 494.40  
CHANNEL LENGTH THRU SUBAREA(FEET) = 971.91 CHANNEL SLOPE = 0.0590  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.98  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.768  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	34.62	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 55.13  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.06  
AVERAGE FLOW DEPTH(FEET) = 0.92 TRAVEL TIME(MIN.) = 3.20  
Tc(MIN.) = 17.02  
SUBAREA AREA(ACRES) = 34.62 SUBAREA RUNOFF(CFS) = 76.90  
EFFECTIVE AREA(ACRES) = 40.95 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 40.9 PEAK FLOW RATE(CFS) = 90.97  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.23

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.23 FLOW VELOCITY(FEET/SEC.) = 5.96  
LONGEST FLOWPATH FROM NODE 12730.00 TO NODE 12732.00 = 1533.45 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12732.00 TO NODE 12733.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 494.40 DOWNSTREAM(FEET) = 431.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1156.41 CHANNEL SLOPE = 0.0548  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.70  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.465  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	59.52	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 149.10  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.78  
AVERAGE FLOW DEPTH(FEET) = 1.65 TRAVEL TIME(MIN.) = 2.84  
Tc(MIN.) = 19.87  
SUBAREA AREA(ACRES) = 59.52 SUBAREA RUNOFF(CFS) = 115.99  
EFFECTIVE AREA(ACRES) = 100.47 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 100.5 PEAK FLOW RATE(CFS) = 195.78  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.92

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.92 FLOW VELOCITY(FEET/SEC.) = 7.37  
LONGEST FLOWPATH FROM NODE 12730.00 TO NODE 12733.00 = 2689.86 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12733.00 TO NODE 12734.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 431.00 DOWNSTREAM(FEET) = 367.11  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1654.48 CHANNEL SLOPE = 0.0386  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.45  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.198  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	64.05	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 250.56  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.99  
AVERAGE FLOW DEPTH(FEET) = 2.42 TRAVEL TIME(MIN.) = 3.94  
Tc(MIN.) = 23.81  
SUBAREA AREA(ACRES) = 64.05 SUBAREA RUNOFF(CFS) = 109.41  
EFFECTIVE AREA(ACRES) = 164.52 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 164.5 PEAK FLOW RATE(CFS) = 281.04  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.57

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.57 FLOW VELOCITY(FEET/SEC.) = 7.23  
LONGEST FLOWPATH FROM NODE 12730.00 TO NODE 12734.00 = 4344.34 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12734.00 TO NODE 12740.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 367.11 DOWNSTREAM(FEET) = 252.10

CHANNEL LENGTH THRU SUBAREA (FEET) = 1880.98 CHANNEL SLOPE = 0.0611  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.37  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.009  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 26.02 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 301.06  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.69  
 AVERAGE FLOW DEPTH (FEET) = 2.35 TRAVEL TIME (MIN.) = 3.61  
 Tc (MIN.) = 27.42  
 SUBAREA AREA (ACRES) = 26.02 SUBAREA RUNOFF (CFS) = 40.03  
 EFFECTIVE AREA (ACRES) = 190.54 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 190.5 PEAK FLOW RATE (CFS) = 293.13  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.32  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.32 FLOW VELOCITY (FEET/SEC.) = 8.62  
 LONGEST FLOWPATH FROM NODE 12730.00 TO NODE 12740.00 = 6225.32 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12734.00 TO NODE 12740.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<  
 =====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION (MIN.) = 27.42  
 RAINFALL INTENSITY (INCH/HR) = 2.01  
 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA (ACRES) = 190.54  
 TOTAL STREAM AREA (ACRES) = 190.54  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 293.13

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26353.12	24.51	2.152	0.30 (0.30)	0.99	5876.2	40500.00
1	27298.86	26.68	2.043	0.30 (0.30)	0.99	6694.9	31500.00
1	27864.69	27.99	1.983	0.30 (0.30)	0.99	7185.2	40440.00
1	28172.27	29.07	1.934	0.30 (0.30)	0.99	7625.0	12710.00
1	28723.84	31.16	1.862	0.30 (0.30)	0.99	8455.4	31600.00
1	29157.42	32.86	1.819	0.30 (0.30)	0.99	9111.8	31810.00
1	30008.82	36.44	1.727	0.30 (0.30)	0.99	10576.2	31400.00
1	31747.91	44.38	1.538	0.30 (0.30)	0.99	13712.8	40100.00
1	34465.26	53.19	1.380	0.30 (0.30)	0.99	17057.1	11801.00
1	37281.02	62.84	1.292	0.30 (0.30)	0.99	21352.5	11530.00
1	39563.45	71.48	1.234	0.30 (0.30)	0.99	26336.3	11910.00

1	41695.69	78.70	1.186	0.30 (0.30)	0.99	30942.5	11330.00
1	42763.27	85.08	1.143	0.30 (0.30)	0.99	35372.8	11130.00
1	42643.79	92.65	1.098	0.30 (0.30)	0.99	39363.1	12330.00
1	42579.74	95.25	1.086	0.30 (0.30)	0.99	40780.1	12410.00
1	42390.92	99.29	1.068	0.30 (0.30)	0.99	42706.1	12400.00
1	41858.51	107.93	1.029	0.30 (0.30)	0.99	46073.5	12201.00
1	41397.70	111.86	1.011	0.30 (0.30)	0.99	47159.8	12111.00
1	40749.82	117.19	0.987	0.30 (0.30)	0.99	48529.1	12101.10
1	40222.59	121.19	0.971	0.30 (0.30)	0.99	49379.9	10400.00
1	38684.95	129.10	0.950	0.30 (0.30)	0.99	50692.0	12010.00
1	37379.62	134.91	0.935	0.30 (0.30)	0.99	51008.5	10210.00
1	37014.31	137.52	0.928	0.30 (0.30)	0.99	51117.5	12000.00
1	33941.30	160.74	0.867	0.30 (0.30)	0.99	51740.6	10100.00
2	293.13	27.42	2.009	0.30 (0.30)	1.00	190.5	12730.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26636.98	24.51	2.152	0.30 (0.30)	0.99	6046.6	40500.00
2	27589.69	26.68	2.043	0.30 (0.30)	0.99	6880.3	31500.00
3	27909.11	27.42	2.009	0.30 (0.30)	0.99	7160.2	12730.00
4	28153.33	27.99	1.983	0.30 (0.30)	0.99	7375.7	40440.00
5	28452.55	29.07	1.934	0.30 (0.30)	0.99	7815.5	12710.00
6	28991.76	31.16	1.862	0.30 (0.30)	0.99	8646.0	31600.00
7	29417.88	32.86	1.819	0.30 (0.30)	0.99	9302.3	31810.00
8	30253.57	36.44	1.727	0.30 (0.30)	0.99	10766.8	31400.00
9	31960.27	44.38	1.538	0.30 (0.30)	0.99	13903.3	40100.00
10	34650.56	53.19	1.380	0.30 (0.30)	0.99	17247.6	11801.00
11	37451.15	62.84	1.292	0.30 (0.30)	0.99	21543.0	11530.00
12	39723.64	71.48	1.234	0.30 (0.30)	0.99	26526.8	11910.00
13	41847.59	78.70	1.186	0.30 (0.30)	0.99	31133.0	11330.00
14	42907.84	85.08	1.143	0.30 (0.30)	0.99	35563.4	11130.00
15	42780.64	92.65	1.098	0.30 (0.30)	0.99	39553.6	12330.00
16	42714.57	95.25	1.086	0.30 (0.30)	0.99	40970.6	12410.00
17	42522.61	99.29	1.068	0.30 (0.30)	0.99	42896.7	12400.00
18	41983.49	107.93	1.029	0.30 (0.30)	0.99	46264.0	12201.00
19	41519.61	111.86	1.011	0.30 (0.30)	0.99	47350.3	12111.00
20	40867.59	117.19	0.987	0.30 (0.30)	0.99	48719.7	12101.10
21	40337.65	121.19	0.971	0.30 (0.30)	0.99	49570.4	10400.00
22	38796.46	129.10	0.950	0.30 (0.30)	0.99	50882.5	12010.00
23	37488.52	134.91	0.935	0.30 (0.30)	0.99	51199.1	10210.00
24	37122.04	137.52	0.928	0.30 (0.30)	0.99	51308.0	12000.00
25	34038.61	160.74	0.867	0.30 (0.30)	0.99	51931.1	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE (CFS) = 42907.84 Tc (MIN.) = 85.08  
 EFFECTIVE AREA (ACRES) = 35563.38 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 51931.1  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12740.00 = 110575.24 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12740.00 TO NODE 12741.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<



>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 252.10 DOWNSTREAM(FEET) = 247.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 401.47 CHANNEL SLOPE = 0.0127
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030
\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.50
CHANNEL FLOW THRU SUBAREA(CFS) = 42907.84
FLOW VELOCITY(FEET/SEC.) = 20.81 FLOW DEPTH(FEET) = 8.50
TRAVEL TIME(MIN.) = 0.32 Tc(MIN.) = 85.40
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12741.00 = 110976.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 25 rows of data.

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 42907.84 Tc(MIN.) = 85.40
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 35563.38

\*\*\*\*\*
FLOW PROCESS FROM NODE 12741.00 TO NODE 12741.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<

\*\*\*\*\*
FLOW PROCESS FROM NODE 12741.00 TO NODE 12741.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<

PEAK FLOWRATE TABLE FILE NAME: 0610313Y.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM Q Tc Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (ACRES) NODE
1 236.92 22.54 0.30( 0.29) 0.97 132.0 31300.00
TOTAL AREA(ACRES) = 132.0

\*\*\*\*\*
FLOW PROCESS FROM NODE 12741.00 TO NODE 12741.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 25 rows of data.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 1 row of data.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 8 rows of data.

9	30423.32	36.80	1.718	0.30	( 0.30)	0.99	10898.7	31400.00
10	32107.71	44.74	1.530	0.30	( 0.30)	0.99	14035.3	40100.00
11	34779.73	53.53	1.377	0.30	( 0.30)	0.99	17379.6	11801.00
12	37569.94	63.17	1.290	0.30	( 0.30)	0.99	21675.0	11530.00
13	39835.55	71.81	1.232	0.30	( 0.30)	0.99	26658.8	11910.00
14	41953.75	79.02	1.184	0.30	( 0.30)	0.99	31265.0	11330.00
15	43008.91	85.40	1.141	0.30	( 0.30)	0.99	35695.3	11130.00
16	42876.44	92.98	1.097	0.30	( 0.30)	0.99	39685.6	12330.00
17	42808.97	95.58	1.085	0.30	( 0.30)	0.99	41102.6	12410.00
18	42614.83	99.61	1.066	0.30	( 0.30)	0.99	43028.6	12400.00
19	42071.05	108.25	1.027	0.30	( 0.30)	0.99	46396.0	12201.00
20	41605.04	112.19	1.009	0.30	( 0.30)	0.99	47482.3	12111.00
21	40950.14	117.52	0.985	0.30	( 0.30)	0.99	48851.6	12101.10
22	40418.39	121.52	0.970	0.30	( 0.30)	0.99	49702.4	10400.00
23	38874.74	129.43	0.949	0.30	( 0.30)	0.99	51014.5	12010.00
24	37564.99	135.25	0.934	0.30	( 0.30)	0.99	51331.0	10210.00
25	37197.70	137.86	0.927	0.30	( 0.30)	0.99	51440.0	12000.00
26	34107.03	161.09	0.866	0.30	( 0.30)	0.99	52063.1	10100.00

TOTAL AREA (ACRES) = 52063.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 43008.91 Tc(MIN.) = 85.400  
EFFECTIVE AREA(ACRES) = 35695.35 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 52063.1  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12741.00 = 110976.71 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12741.00 TO NODE 12800.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 247.00 DOWNSTREAM(FEET) = 240.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 819.00 CHANNEL SLOPE = 0.0085  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 9.53  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.136

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	17.31	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 43015.42

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 18.23

AVERAGE FLOW DEPTH(FEET) = 9.53 TRAVEL TIME(MIN.) = 0.75

Tc(MIN.) = 86.15

SUBAREA AREA(ACRES) = 17.31 SUBAREA RUNOFF(CFS) = 13.02

EFFECTIVE AREA(ACRES) = 35712.66 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99

TOTAL AREA(ACRES) = 52080.4 PEAK FLOW RATE(CFS) = 43008.91

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 9.53

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 9.53 FLOW VELOCITY(FEET/SEC.) = 18.23

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12800.00 = 111795.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26417.26	23.42	2.224	0.30( 0.30)	0.99	5625.6	31300.00
2	26855.35	25.76	2.084	0.30( 0.30)	0.99	6195.8	40500.00
3	27796.07	27.92	1.986	0.30( 0.30)	0.99	7029.6	31500.00
4	28111.53	28.65	1.953	0.30( 0.30)	0.99	7309.5	12730.00
5	28352.64	29.22	1.927	0.30( 0.30)	0.99	7525.0	40440.00
6	28646.07	30.29	1.885	0.30( 0.30)	0.99	7964.8	12710.00
7	29177.58	32.38	1.831	0.30( 0.30)	0.99	8795.3	31600.00
8	29598.53	34.07	1.788	0.30( 0.30)	0.99	9451.6	31810.00
9	30423.32	37.64	1.696	0.30( 0.30)	0.99	10916.1	31400.00
10	32107.71	45.56	1.512	0.30( 0.30)	0.99	14052.6	40100.00
11	34779.73	54.34	1.369	0.30( 0.30)	0.99	17396.9	11801.00
12	37569.94	63.95	1.285	0.30( 0.30)	0.99	21692.3	11530.00
13	39835.55	72.57	1.227	0.30( 0.30)	0.99	26676.1	11910.00
14	41953.75	79.77	1.179	0.30( 0.30)	0.99	31282.3	11330.00
15	43008.91	86.15	1.136	0.30( 0.30)	0.99	35712.7	11130.00
16	42876.44	93.73	1.093	0.30( 0.30)	0.99	39702.9	12330.00
17	42808.97	96.33	1.081	0.30( 0.30)	0.99	41119.9	12410.00
18	42614.83	100.36	1.063	0.30( 0.30)	0.99	43045.9	12400.00
19	42071.05	109.00	1.024	0.30( 0.30)	0.99	46413.3	12201.00
20	41605.04	112.95	1.006	0.30( 0.30)	0.99	47499.6	12111.00
21	40950.14	118.28	0.982	0.30( 0.30)	0.99	48868.9	12101.10
22	40418.39	122.28	0.968	0.30( 0.30)	0.99	49719.7	10400.00
23	38874.74	130.21	0.947	0.30( 0.30)	0.99	51031.8	12010.00
24	37564.99	136.03	0.932	0.30( 0.30)	0.99	51348.3	10210.00
25	37197.70	138.64	0.925	0.30( 0.30)	0.99	51457.3	12000.00
26	34107.03	161.90	0.864	0.30( 0.30)	0.99	52080.4	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 43008.91 Tc(MIN.) = 86.15  
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 35712.66

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 52080.4 TC(MIN.) = 86.15  
EFFECTIVE AREA(ACRES) = 35712.66 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.994  
PEAK FLOW RATE(CFS) = 43008.91

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26417.26	23.42	2.224	0.30( 0.30)	0.99	5625.6	31300.00
2	26855.35	25.76	2.084	0.30( 0.30)	0.99	6195.8	40500.00
3	27796.07	27.92	1.986	0.30( 0.30)	0.99	7029.6	31500.00
4	28111.53	28.65	1.953	0.30( 0.30)	0.99	7309.5	12730.00
5	28352.64	29.22	1.927	0.30( 0.30)	0.99	7525.0	40440.00
6	28646.07	30.29	1.885	0.30( 0.30)	0.99	7964.8	12710.00
7	29177.58	32.38	1.831	0.30( 0.30)	0.99	8795.3	31600.00
8	29598.53	34.07	1.788	0.30( 0.30)	0.99	9451.6	31810.00
9	30423.32	37.64	1.696	0.30( 0.30)	0.99	10916.1	31400.00
10	32107.71	45.56	1.512	0.30( 0.30)	0.99	14052.6	40100.00
11	34779.73	54.34	1.369	0.30( 0.30)	0.99	17396.9	11801.00

12	37569.94	63.95	1.285	0.30	( 0.30)	0.99	21692.3	11530.00
13	39835.55	72.57	1.227	0.30	( 0.30)	0.99	26676.1	11910.00
14	41953.75	79.77	1.179	0.30	( 0.30)	0.99	31282.3	11330.00
15	43008.91	86.15	1.136	0.30	( 0.30)	0.99	35712.7	11130.00
16	42876.44	93.73	1.093	0.30	( 0.30)	0.99	39702.9	12330.00
17	42808.97	96.33	1.081	0.30	( 0.30)	0.99	41119.9	12410.00
18	42614.83	100.36	1.063	0.30	( 0.30)	0.99	43045.9	12400.00
19	42071.05	109.00	1.024	0.30	( 0.30)	0.99	46413.3	12201.00
20	41605.04	112.95	1.006	0.30	( 0.30)	0.99	47499.6	12111.00
21	40950.14	118.28	0.982	0.30	( 0.30)	0.99	48868.9	12101.10
22	40418.39	122.28	0.968	0.30	( 0.30)	0.99	49719.7	10400.00
23	38874.74	130.21	0.947	0.30	( 0.30)	0.99	51031.8	12010.00
24	37564.99	136.03	0.932	0.30	( 0.30)	0.99	51348.3	10210.00
25	37197.70	138.64	0.925	0.30	( 0.30)	0.99	51457.3	12000.00
26	34107.03	161.90	0.864	0.30	( 0.30)	0.99	52080.4	10100.00

=====  
=====  
END OF RATIONAL METHOD ANALYSIS

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

Michael Baker International  
5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

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FILE NAME: S28.DAT  
TIME/DATE OF STUDY: 08:14 07/16/2018  
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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
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---\*TIME-OF-CONCENTRATION MODEL\*---

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14  
1) 5.00; 6.035  
2) 10.00; 3.868  
3) 15.00; 2.984  
4) 20.00; 2.451  
5) 25.00; 2.119  
6) 30.00; 1.892  
7) 40.00; 1.636  
8) 50.00; 1.413  
9) 60.00; 1.311  
10) 90.00; 1.110  
11) 120.00; 0.974  
12) 180.00; 0.817  
13) 360.00; 0.608  
14) 1200.00; 0.267  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*  
HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING  
WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR  
NO. (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) (n)  
==== =

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 12800.00 TO NODE 12800.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 3 <<<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: 0610501Y.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1712.17	25.43	0.30 ( 0.29)	0.98	1025.4	50120.00
2	1673.65	26.63	0.30 ( 0.29)	0.98	1040.0	50150.00
3	1553.32	30.32	0.30 ( 0.29)	0.98	1063.4	50100.00
TOTAL AREA (ACRES) =		1063.4				

\*\*\*\*\*

FLOW PROCESS FROM NODE 12800.00 TO NODE 12800.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1712.17	25.43	0.30 ( 0.29)	0.98	1025.4	50120.00
2	1673.65	26.63	0.30 ( 0.29)	0.98	1040.0	50150.00
3	1553.32	30.32	0.30 ( 0.29)	0.98	1063.4	50100.00
TOTAL AREA (ACRES) =		1063.4				

-----  
END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 1063.4 TC (MIN.) = 25.43  
EFFECTIVE AREA (ACRES) = 1025.44 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.981  
PEAK FLOW RATE (CFS) = 1712.17

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1712.17	25.43	2.099	0.30 ( 0.29)	0.98	1025.4	50120.00
2	1673.65	26.63	2.045	0.30 ( 0.29)	0.98	1040.0	50150.00
3	1553.32	30.32	1.884	0.30 ( 0.29)	0.98	1063.4	50100.00

-----  
END OF RATIONAL METHOD ANALYSIS  
=====

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2013 Advanced Engineering Software (aes)  
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

Michael Baker International  
5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

-----  
FILE NAME: S29.DAT  
TIME/DATE OF STUDY: 08:14 07/16/2018  
=====

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-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 6.013
- 2) 10.00; 3.857
- 3) 15.00; 2.977
- 4) 20.00; 2.447
- 5) 25.00; 2.116
- 6) 30.00; 1.889
- 7) 40.00; 1.633
- 8) 50.00; 1.411
- 9) 60.00; 1.308
- 10) 90.00; 1.107
- 11) 120.00; 0.970
- 12) 180.00; 0.814
- 13) 360.00; 0.605
- 14) 1200.00; 0.265

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 12740.00 TO NODE 12800.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<<  
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PEAK FLOWRATE TABLE FILE NAME: S27.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26855.35	25.76	0.30 ( 0.30)	0.99	6195.8	40500.00
2	28646.07	30.29	0.30 ( 0.30)	0.99	7964.8	12710.00
3	29598.53	34.07	0.30 ( 0.30)	0.99	9451.6	31810.00
4	30423.32	37.64	0.30 ( 0.30)	0.99	10916.1	31400.00
5	32107.71	45.56	0.30 ( 0.30)	0.99	14052.6	40100.00
6	34779.73	54.34	0.30 ( 0.30)	0.99	17396.9	11801.00
7	37569.94	63.95	0.30 ( 0.30)	0.99	21692.3	11530.00
8	39835.55	72.57	0.30 ( 0.30)	0.99	26676.1	11910.00
9	41953.75	79.77	0.30 ( 0.30)	0.99	31282.3	11330.00
10	43008.91	86.15	0.30 ( 0.30)	0.99	35712.7	11130.00
11	42876.44	93.73	0.30 ( 0.30)	0.99	39702.9	12330.00
12	42614.83	100.36	0.30 ( 0.30)	0.99	43045.9	12400.00
13	42071.05	109.00	0.30 ( 0.30)	0.99	46413.3	12201.00
14	41605.04	112.95	0.30 ( 0.30)	0.99	47499.6	12111.00
15	40950.14	118.28	0.30 ( 0.30)	0.99	48868.9	12101.10
16	40418.39	122.28	0.30 ( 0.30)	0.99	49719.7	10400.00
17	38874.74	130.21	0.30 ( 0.30)	0.99	51031.8	12010.00
18	37564.99	136.03	0.30 ( 0.30)	0.99	51348.3	10210.00
19	37197.70	138.64	0.30 ( 0.30)	0.99	51457.3	12000.00
20	34107.03	161.90	0.30 ( 0.30)	0.99	52080.4	10100.00

TOTAL AREA (ACRES) = 52080.4

\*\*\*\*\*

FLOW PROCESS FROM NODE 12800.00 TO NODE 12800.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: S28.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1712.17	25.43	0.30 ( 0.29)	0.98	1025.4	50120.00
2	1673.65	26.63	0.30 ( 0.29)	0.98	1040.0	50150.00
3	1553.32	30.32	0.30 ( 0.29)	0.98	1063.4	50100.00

TOTAL AREA (ACRES) = 1063.4

\*\*\*\*\*

FLOW PROCESS FROM NODE 12800.00 TO NODE 12800.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1712.17	25.43	0.30 ( 0.29)	0.98	1025.4	50120.00
2	1673.65	26.63	0.30 ( 0.29)	0.98	1040.0	50150.00
3	1553.32	30.32	0.30 ( 0.29)	0.98	1063.4	50100.00

TOTAL AREA (ACRES) = 1063.4

\*\*\*\*\*

FLOW PROCESS FROM NODE 12740.00 TO NODE 12800.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1712.17	25.43	2.096	0.30 ( 0.29)	0.98	1025.4	50120.00
2	1673.65	26.63	2.042	0.30 ( 0.29)	0.98	1040.0	50150.00
3	1553.32	30.32	1.881	0.30 ( 0.29)	0.98	1063.4	50100.00

LONGEST FLOWPATH FROM NODE 50150.00 TO NODE 12800.00 = 11349.00 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26855.35	25.76	2.081	0.30 ( 0.30)	0.99	6195.8	40500.00
2	28646.07	30.29	1.882	0.30 ( 0.30)	0.99	7964.8	12710.00
3	29598.53	34.07	1.785	0.30 ( 0.30)	0.99	9451.6	31810.00
4	30423.32	37.64	1.693	0.30 ( 0.30)	0.99	10916.1	31400.00
5	32107.71	45.56	1.510	0.30 ( 0.30)	0.99	14052.6	40100.00
6	34779.73	54.34	1.366	0.30 ( 0.30)	0.99	17396.9	11801.00
7	37569.94	63.95	1.282	0.30 ( 0.30)	0.99	21692.3	11530.00
8	39835.55	72.57	1.224	0.30 ( 0.30)	0.99	26676.1	11910.00
9	41953.75	79.77	1.176	0.30 ( 0.30)	0.99	31282.3	11330.00
10	43008.91	86.15	1.133	0.30 ( 0.30)	0.99	35712.7	11130.00
11	42876.44	93.73	1.090	0.30 ( 0.30)	0.99	39702.9	12330.00
12	42614.83	100.36	1.060	0.30 ( 0.30)	0.99	43045.9	12400.00
13	42071.05	109.00	1.020	0.30 ( 0.30)	0.99	46413.3	12201.00
14	41605.04	112.95	1.002	0.30 ( 0.30)	0.99	47499.6	12111.00
15	40950.14	118.28	0.978	0.30 ( 0.30)	0.99	48868.9	12101.10
16	40418.39	122.28	0.964	0.30 ( 0.30)	0.99	49719.7	10400.00
17	38874.74	130.21	0.943	0.30 ( 0.30)	0.99	51031.8	12010.00
18	37564.99	136.03	0.928	0.30 ( 0.30)	0.99	51348.3	10210.00
19	37197.70	138.64	0.922	0.30 ( 0.30)	0.99	51457.3	12000.00
20	34107.03	161.90	0.861	0.30 ( 0.30)	0.99	52080.4	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12800.00 = 111795.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	28445.49	25.43	2.096	0.30 ( 0.30)	0.99	7141.5	50120.00
2	28556.84	25.76	2.081	0.30 ( 0.30)	0.99	7225.3	40500.00
3	28871.10	26.63	2.042	0.30 ( 0.30)	0.99	7573.8	50150.00
4	30200.17	30.29	1.882	0.30 ( 0.30)	0.99	9028.0	12710.00
5	30205.39	30.32	1.881	0.30 ( 0.30)	0.99	9037.5	50100.00
6	31057.73	34.07	1.785	0.30 ( 0.30)	0.99	10515.0	31810.00
7	31793.06	37.64	1.693	0.30 ( 0.30)	0.99	11979.4	31400.00
8	33297.43	45.56	1.510	0.30 ( 0.30)	0.99	15116.0	40100.00
9	35829.21	54.34	1.366	0.30 ( 0.30)	0.99	18460.3	11801.00
10	38536.38	63.95	1.282	0.30 ( 0.30)	0.99	22755.7	11530.00
11	40745.45	72.57	1.224	0.30 ( 0.30)	0.99	27739.5	11910.00
12	42816.41	79.77	1.176	0.30 ( 0.30)	0.99	32345.7	11330.00
13	43829.75	86.15	1.133	0.30 ( 0.30)	0.99	36776.0	11130.00
14	43655.36	93.73	1.090	0.30 ( 0.30)	0.99	40766.3	12330.00
15	43364.08	100.36	1.060	0.30 ( 0.30)	0.99	44109.3	12400.00

16	42781.65	109.00	1.020	0.30 ( 0.30)	0.99	47476.7	12201.00
17	42298.02	112.95	1.002	0.30 ( 0.30)	0.99	48563.0	12111.00
18	41619.26	118.28	0.978	0.30 ( 0.30)	0.99	49932.3	12101.10
19	41074.02	122.28	0.964	0.30 ( 0.30)	0.99	50783.1	10400.00
20	39510.20	130.21	0.943	0.30 ( 0.30)	0.99	52095.2	12010.00
21	38185.61	136.03	0.928	0.30 ( 0.30)	0.99	52411.7	10210.00
22	37811.67	138.64	0.922	0.30 ( 0.30)	0.99	52520.7	12000.00
23	34661.81	161.90	0.861	0.30 ( 0.30)	0.99	53143.8	10100.00

TOTAL AREA (ACRES) = 53143.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 43829.75 Tc(MIN.) = 86.148  
EFFECTIVE AREA(ACRES) = 36776.04 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 53143.8  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12800.00 = 111795.71 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12800.00 TO NODE 12801.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 240.00 DOWNSTREAM(FEET) = 234.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1110.96 CHANNEL SLOPE = 0.0054  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.96  
CHANNEL FLOW THRU SUBAREA(CFS) = 43829.75  
FLOW VELOCITY(FEET/SEC.) = 15.70 FLOW DEPTH(FEET) = 10.96  
TRAVEL TIME(MIN.) = 1.18 Tc(MIN.) = 87.33  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12801.00 = 112906.67 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	28445.49	26.79	2.035	0.30 ( 0.30)	0.99	7141.5	50120.00
2	28556.84	27.12	2.020	0.30 ( 0.30)	0.99	7225.3	40500.00
3	28871.10	27.98	1.981	0.30 ( 0.30)	0.99	7573.8	50150.00
4	30200.17	31.62	1.847	0.30 ( 0.30)	0.99	9028.0	12710.00
5	30205.39	31.65	1.847	0.30 ( 0.30)	0.99	9037.5	50100.00
6	31057.73	35.39	1.751	0.30 ( 0.30)	0.99	10515.0	31810.00
7	31793.06	38.95	1.660	0.30 ( 0.30)	0.99	11979.4	31400.00
8	33297.43	46.85	1.481	0.30 ( 0.30)	0.99	15116.0	40100.00
9	35829.21	55.60	1.353	0.30 ( 0.30)	0.99	18460.3	11801.00
10	38536.38	65.18	1.273	0.30 ( 0.30)	0.99	22755.7	11530.00
11	40745.45	73.78	1.216	0.30 ( 0.30)	0.99	27739.5	11910.00
12	42816.41	80.96	1.168	0.30 ( 0.30)	0.99	32345.7	11330.00
13	43829.75	87.33	1.125	0.30 ( 0.30)	0.99	36776.0	11130.00
14	43655.36	94.91	1.085	0.30 ( 0.30)	0.99	40766.3	12330.00
15	43364.08	101.54	1.054	0.30 ( 0.30)	0.99	44109.3	12400.00
16	42781.65	110.19	1.015	0.30 ( 0.30)	0.99	47476.7	12201.00
17	42298.02	114.14	0.997	0.30 ( 0.30)	0.99	48563.0	12111.00
18	41619.26	119.48	0.972	0.30 ( 0.30)	0.99	49932.3	12101.10
19	41074.02	123.49	0.961	0.30 ( 0.30)	0.99	50783.1	10400.00
20	39510.20	131.43	0.940	0.30 ( 0.30)	0.99	52095.2	12010.00
21	38185.61	137.27	0.925	0.30 ( 0.30)	0.99	52411.7	10210.00
22	37811.67	139.88	0.918	0.30 ( 0.30)	0.99	52520.7	12000.00

23 34661.81 163.17 0.858 0.30( 0.30) 0.99 53143.8 10100.00  
 NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 43829.75 Tc(MIN.) = 87.33  
 AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 36776.04

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12801.00 TO NODE 12801.00 IS CODE = 12  
 -----  
 >>>>CLEAR MEMORY BANK # 1 <<<<<<  
 =====

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12801.00 TO NODE 12801.00 IS CODE = 15.1  
 -----  
 >>>>DEFINE MEMORY BANK # 1 <<<<<<  
 =====

PEAK FLOWRATE TABLE FILE NAME: 0610502Y.DNA  
 MEMORY BANK # 1 DEFINED AS FOLLOWS:  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	89.50	10.73	0.30( 0.28)	0.94	28.9	50200.00	
TOTAL AREA(ACRES) =							28.9

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12801.00 TO NODE 12801.00 IS CODE = 11  
 -----  
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<<  
 =====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	28445.49	26.79	2.035	0.30( 0.30)	0.99	7141.5	50120.00
2	28556.84	27.12	2.020	0.30( 0.30)	0.99	7225.3	40500.00
3	28871.10	27.98	1.981	0.30( 0.30)	0.99	7573.8	50150.00
4	30200.17	31.62	1.847	0.30( 0.30)	0.99	9028.0	12710.00
5	30205.39	31.65	1.847	0.30( 0.30)	0.99	9037.5	50100.00
6	31057.73	35.39	1.751	0.30( 0.30)	0.99	10515.0	31810.00
7	31793.06	38.95	1.660	0.30( 0.30)	0.99	11979.4	31400.00
8	33297.43	46.85	1.481	0.30( 0.30)	0.99	15116.0	40100.00
9	35829.21	55.60	1.353	0.30( 0.30)	0.99	18460.3	11801.00
10	38536.38	65.18	1.273	0.30( 0.30)	0.99	22755.7	11530.00
11	40745.45	73.78	1.216	0.30( 0.30)	0.99	27739.5	11910.00
12	42816.41	80.96	1.168	0.30( 0.30)	0.99	32345.7	11330.00
13	43829.75	87.33	1.125	0.30( 0.30)	0.99	36776.0	11130.00
14	43655.36	94.91	1.085	0.30( 0.30)	0.99	40766.3	12330.00
15	43364.08	101.54	1.054	0.30( 0.30)	0.99	44109.3	12400.00
16	42781.65	110.19	1.015	0.30( 0.30)	0.99	47476.7	12201.00
17	42298.02	114.14	0.997	0.30( 0.30)	0.99	48563.0	12111.00
18	41619.26	119.48	0.972	0.30( 0.30)	0.99	49932.3	12101.10
19	41074.02	123.49	0.961	0.30( 0.30)	0.99	50783.1	10400.00
20	39510.20	131.43	0.940	0.30( 0.30)	0.99	52095.2	12010.00
21	38185.61	137.27	0.925	0.30( 0.30)	0.99	52411.7	10210.00
22	37811.67	139.88	0.918	0.30( 0.30)	0.99	52520.7	12000.00
23	34661.81	163.17	0.858	0.30( 0.30)	0.99	53143.8	10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12801.00 =							112906.67 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	89.50	10.73	3.728	0.30( 0.28)	0.94	28.9	50200.00
LONGEST FLOWPATH FROM NODE 50200.00 TO NODE 12801.00 =							1426.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22588.72	10.73	3.728	0.30( 0.30)	0.99	2890.1	50200.00
2	28491.03	26.79	2.035	0.30( 0.30)	0.99	7170.4	50120.00
3	28601.99	27.12	2.020	0.30( 0.30)	0.99	7254.2	40500.00
4	28915.23	27.98	1.981	0.30( 0.30)	0.99	7602.6	50150.00
5	30240.85	31.62	1.847	0.30( 0.30)	0.99	9056.9	12710.00
6	30246.05	31.65	1.847	0.30( 0.30)	0.99	9066.4	50100.00
7	31095.91	35.39	1.751	0.30( 0.30)	0.99	10543.9	31810.00
8	31828.87	38.95	1.660	0.30( 0.30)	0.99	12008.3	31400.00
9	33328.59	46.85	1.481	0.30( 0.30)	0.99	15144.8	40100.00
10	35857.06	55.60	1.353	0.30( 0.30)	0.99	18489.2	11801.00
11	38562.15	65.18	1.273	0.30( 0.30)	0.99	22784.6	11530.00
12	40769.72	73.78	1.216	0.30( 0.30)	0.99	27768.4	11910.00
13	42839.43	80.96	1.168	0.30( 0.30)	0.99	32374.6	11330.00
14	43851.66	87.33	1.125	0.30( 0.30)	0.99	36804.9	11130.00
15	43676.23	94.91	1.085	0.30( 0.30)	0.99	40795.1	12330.00
16	43384.16	101.54	1.054	0.30( 0.30)	0.99	44138.2	12400.00
17	42800.71	110.19	1.015	0.30( 0.30)	0.99	47505.6	12201.00
18	42316.61	114.14	0.997	0.30( 0.30)	0.99	48591.8	12111.00
19	41637.21	119.48	0.972	0.30( 0.30)	0.99	49961.2	12101.10
20	41091.68	123.49	0.961	0.30( 0.30)	0.99	50811.9	10400.00
21	39527.32	131.43	0.940	0.30( 0.30)	0.99	52124.0	12010.00
22	38202.34	137.27	0.925	0.30( 0.30)	0.99	52440.6	10210.00
23	37828.22	139.88	0.918	0.30( 0.30)	0.99	52549.5	12000.00
24	34676.79	163.17	0.858	0.30( 0.30)	0.99	53172.6	10100.00
TOTAL AREA(ACRES) =							53172.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 43851.66 Tc(MIN.) = 87.328  
 EFFECTIVE AREA(ACRES) = 36804.91 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 53172.6  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12801.00 = 112906.67 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12801.00 TO NODE 12901.00 IS CODE = 56  
 -----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 234.00 DOWNSTREAM(FEET) = 216.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2009.32 CHANNEL SLOPE = 0.0090  
 GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 9.51  
 CHANNEL FLOW THRU SUBAREA(CFS) = 43851.66  
 FLOW VELOCITY(FEET/SEC.) = 18.63 FLOW DEPTH(FEET) = 9.51  
 TRAVEL TIME(MIN.) = 1.80 Tc(MIN.) = 89.13  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22588.72	12.98	3.333	0.30 ( 0.30)	0.99	2890.1	50200.00
2	28491.03	28.86	1.941	0.30 ( 0.30)	0.99	7170.4	50120.00
3	28601.99	29.19	1.926	0.30 ( 0.30)	0.99	7254.2	40500.00
4	28915.23	30.04	1.888	0.30 ( 0.30)	0.99	7602.6	50150.00
5	30240.85	33.66	1.795	0.30 ( 0.30)	0.99	9056.9	12710.00
6	30246.05	33.68	1.795	0.30 ( 0.30)	0.99	9066.4	50100.00
7	31095.91	37.40	1.700	0.30 ( 0.30)	0.99	10543.9	31810.00
8	31828.87	40.95	1.612	0.30 ( 0.30)	0.99	12008.3	31400.00
9	33328.59	48.82	1.437	0.30 ( 0.30)	0.99	15144.8	40100.00
10	35857.06	57.52	1.334	0.30 ( 0.30)	0.99	18489.2	11801.00
11	38562.15	67.06	1.261	0.30 ( 0.30)	0.99	22784.6	11530.00
12	40769.72	75.62	1.203	0.30 ( 0.30)	0.99	27768.4	11910.00
13	42839.43	82.77	1.155	0.30 ( 0.30)	0.99	32374.6	11330.00
14	43851.66	89.13	1.113	0.30 ( 0.30)	0.99	36804.9	11130.00
15	43676.23	96.71	1.076	0.30 ( 0.30)	0.99	40795.1	12330.00
16	43384.16	103.35	1.046	0.30 ( 0.30)	0.99	44138.2	12400.00
17	42800.71	112.00	1.007	0.30 ( 0.30)	0.99	47505.6	12201.00
18	42316.61	115.96	0.988	0.30 ( 0.30)	0.99	48591.8	12111.00
19	41637.21	121.31	0.967	0.30 ( 0.30)	0.99	49961.2	12101.10
20	41091.68	125.32	0.956	0.30 ( 0.30)	0.99	50811.9	10400.00
21	39527.32	133.28	0.935	0.30 ( 0.30)	0.99	52124.0	12010.00
22	38202.34	139.15	0.920	0.30 ( 0.30)	0.99	52440.6	10210.00
23	37828.22	141.77	0.913	0.30 ( 0.30)	0.99	52549.5	12000.00
24	34676.79	165.11	0.853	0.30 ( 0.30)	0.99	53172.6	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 43851.66 Tc(MIN.) = 89.13  
 AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 36804.91

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610312Y.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	562.17	29.63	1.906	0.30 ( 0.29)	0.96	385.8	31200.00
TOTAL AREA(ACRES) =			385.8				

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22588.72	12.98	3.333	0.30 ( 0.30)	0.99	2890.1	50200.00
2	28491.03	28.86	1.941	0.30 ( 0.30)	0.99	7170.4	50120.00
3	28601.99	29.19	1.926	0.30 ( 0.30)	0.99	7254.2	40500.00
4	28915.23	30.04	1.888	0.30 ( 0.30)	0.99	7602.6	50150.00
5	30240.85	33.66	1.795	0.30 ( 0.30)	0.99	9056.9	12710.00

6	30246.05	33.68	1.795	0.30 ( 0.30)	0.99	9066.4	50100.00
7	31095.91	37.40	1.700	0.30 ( 0.30)	0.99	10543.9	31810.00
8	31828.87	40.95	1.612	0.30 ( 0.30)	0.99	12008.3	31400.00
9	33328.59	48.82	1.437	0.30 ( 0.30)	0.99	15144.8	40100.00
10	35857.06	57.52	1.334	0.30 ( 0.30)	0.99	18489.2	11801.00
11	38562.15	67.06	1.261	0.30 ( 0.30)	0.99	22784.6	11530.00
12	40769.72	75.62	1.203	0.30 ( 0.30)	0.99	27768.4	11910.00
13	42839.43	82.77	1.155	0.30 ( 0.30)	0.99	32374.6	11330.00
14	43851.66	89.13	1.113	0.30 ( 0.30)	0.99	36804.9	11130.00
15	43676.23	96.71	1.076	0.30 ( 0.30)	0.99	40795.1	12330.00
16	43384.16	103.35	1.046	0.30 ( 0.30)	0.99	44138.2	12400.00
17	42800.71	112.00	1.007	0.30 ( 0.30)	0.99	47505.6	12201.00
18	42316.61	115.96	0.988	0.30 ( 0.30)	0.99	48591.8	12111.00
19	41637.21	121.31	0.967	0.30 ( 0.30)	0.99	49961.2	12101.10
20	41091.68	125.32	0.956	0.30 ( 0.30)	0.99	50811.9	10400.00
21	39527.32	133.28	0.935	0.30 ( 0.30)	0.99	52124.0	12010.00
22	38202.34	139.15	0.920	0.30 ( 0.30)	0.99	52440.6	10210.00
23	37828.22	141.77	0.913	0.30 ( 0.30)	0.99	52549.5	12000.00
24	34676.79	165.11	0.853	0.30 ( 0.30)	0.99	53172.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	562.17	29.63	1.906	0.30 ( 0.29)	0.96	385.8	31200.00

LONGEST FLOWPATH FROM NODE 31200.00 TO NODE 12901.00 = 11169.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23051.94	12.98	3.333	0.30 ( 0.30)	0.99	3059.0	50200.00
2	29050.43	28.86	1.941	0.30 ( 0.30)	0.99	7546.2	50120.00
3	29162.65	29.19	1.926	0.30 ( 0.30)	0.99	7634.3	40500.00
4	29324.67	29.63	1.906	0.30 ( 0.30)	0.99	7818.5	31200.00
5	29471.14	30.04	1.888	0.30 ( 0.30)	0.99	7988.4	50150.00
6	30764.65	33.66	1.795	0.30 ( 0.30)	0.99	9442.7	12710.00
7	30769.65	33.68	1.795	0.30 ( 0.30)	0.99	9452.2	50100.00
8	31586.41	37.40	1.700	0.30 ( 0.30)	0.99	10929.6	31810.00
9	32288.99	40.95	1.612	0.30 ( 0.30)	0.99	12394.1	31400.00
10	33728.06	48.82	1.437	0.30 ( 0.30)	0.99	15530.6	40100.00
11	36220.54	57.52	1.334	0.30 ( 0.30)	0.99	18874.9	11801.00
12	38900.33	67.06	1.261	0.30 ( 0.30)	0.99	23170.3	11530.00
13	41087.98	75.62	1.203	0.30 ( 0.30)	0.99	28154.1	11910.00
14	43141.06	82.77	1.155	0.30 ( 0.30)	0.99	32760.3	11330.00
15	44138.52	89.13	1.113	0.30 ( 0.30)	0.99	37190.7	11130.00
16	43950.42	96.71	1.076	0.30 ( 0.30)	0.99	41180.9	12330.00
17	43647.83	103.35	1.046	0.30 ( 0.30)	0.99	44524.0	12400.00
18	43050.65	112.00	1.007	0.30 ( 0.30)	0.99	47891.3	12201.00
19	42560.29	115.96	0.988	0.30 ( 0.30)	0.99	48977.6	12111.00
20	41873.30	121.31	0.967	0.30 ( 0.30)	0.99	50347.0	12101.10
21	41324.14	125.32	0.956	0.30 ( 0.30)	0.99	51197.7	10400.00
22	39752.59	133.28	0.935	0.30 ( 0.30)	0.99	52509.8	12010.00
23	38422.32	139.15	0.920	0.30 ( 0.30)	0.99	52826.4	10210.00
24	38045.84	141.77	0.913	0.30 ( 0.30)	0.99	52935.3	12000.00
25	34873.35	165.11	0.853	0.30 ( 0.30)	0.99	53558.4	10100.00
TOTAL AREA(ACRES) =						53558.4	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:



PEAK FLOW RATE(CFS) = 44138.52 Tc(MIN.) = 89.125  
 EFFECTIVE AREA(ACRES) = 37190.69 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 53558.4  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610503Y.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	637.49	23.23	2.233	0.30 ( 0.30)	0.99	366.1	50300.00
TOTAL AREA(ACRES) =							366.1

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23051.94	12.98	3.333	0.30( 0.30)	0.99	3059.0	50200.00
2	29050.43	28.86	1.941	0.30( 0.30)	0.99	7546.2	50120.00
3	29162.65	29.19	1.926	0.30( 0.30)	0.99	7634.3	40500.00
4	29324.67	29.63	1.906	0.30( 0.30)	0.99	7818.5	31200.00
5	29471.14	30.04	1.888	0.30( 0.30)	0.99	7988.4	50150.00
6	30764.65	33.66	1.795	0.30( 0.30)	0.99	9442.7	12710.00
7	30769.65	33.68	1.795	0.30( 0.30)	0.99	9452.2	50100.00
8	31586.41	37.40	1.700	0.30( 0.30)	0.99	10929.6	31810.00
9	32288.99	40.95	1.612	0.30( 0.30)	0.99	12394.1	31400.00
10	33728.06	48.82	1.437	0.30( 0.30)	0.99	15530.6	40100.00
11	36220.54	57.52	1.334	0.30( 0.30)	0.99	18874.9	11801.00
12	38900.33	67.06	1.261	0.30( 0.30)	0.99	23170.3	11530.00
13	41087.98	75.62	1.203	0.30( 0.30)	0.99	28154.1	11910.00
14	43141.06	82.77	1.155	0.30( 0.30)	0.99	32760.3	11330.00
15	44138.52	89.13	1.113	0.30( 0.30)	0.99	37190.7	11130.00
16	43950.42	96.71	1.076	0.30( 0.30)	0.99	41180.9	12330.00
17	43647.83	103.35	1.046	0.30( 0.30)	0.99	44524.0	12400.00
18	43050.65	112.00	1.007	0.30( 0.30)	0.99	47891.3	12201.00
19	42560.29	115.96	0.988	0.30( 0.30)	0.99	48977.6	12111.00
20	41873.30	121.31	0.967	0.30( 0.30)	0.99	50347.0	12101.10
21	41324.14	125.32	0.956	0.30( 0.30)	0.99	51197.7	10400.00
22	39752.59	133.28	0.935	0.30( 0.30)	0.99	52509.8	12010.00
23	38422.32	139.15	0.920	0.30( 0.30)	0.99	52826.4	10210.00
24	38045.84	141.77	0.913	0.30( 0.30)	0.99	52935.3	12000.00
25	34873.35	165.11	0.853	0.30( 0.30)	0.99	53558.4	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	637.49	23.23	2.233	0.30( 0.30)	0.99	366.1	50300.00
LONGEST FLOWPATH FROM NODE 50300.00 TO NODE 12901.00 =							8614.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23610.42	12.98	3.333	0.30( 0.30)	0.99	3263.6	50200.00
2	27559.87	23.23	2.233	0.30( 0.30)	0.99	6320.4	50300.00
3	29591.50	28.86	1.941	0.30( 0.30)	0.99	7912.3	50120.00
4	29698.84	29.19	1.926	0.30( 0.30)	0.99	8000.4	40500.00
5	29854.32	29.63	1.906	0.30( 0.30)	0.99	8184.6	31200.00
6	29994.84	30.04	1.888	0.30( 0.30)	0.99	8354.5	50150.00
7	31257.90	33.66	1.795	0.30( 0.30)	0.99	9808.8	12710.00
8	31262.71	33.68	1.795	0.30( 0.30)	0.99	9818.3	50100.00
9	32048.08	37.40	1.700	0.30( 0.30)	0.99	11295.8	31810.00
10	32721.84	40.95	1.612	0.30( 0.30)	0.99	12760.2	31400.00
11	34103.38	48.82	1.437	0.30( 0.30)	0.99	15896.7	40100.00
12	36561.71	57.52	1.334	0.30( 0.30)	0.99	19241.0	11801.00
13	39217.50	67.06	1.261	0.30( 0.30)	0.99	23536.5	11530.00
14	41386.26	75.62	1.203	0.30( 0.30)	0.99	28520.3	11910.00
15	43423.56	82.77	1.155	0.30( 0.30)	0.99	33126.4	11330.00
16	44407.00	89.13	1.113	0.30( 0.30)	0.99	37556.8	11130.00
17	44206.89	96.71	1.076	0.30( 0.30)	0.99	41547.0	12330.00
18	43894.31	103.35	1.046	0.30( 0.30)	0.99	44890.1	12400.00
19	43284.12	112.00	1.007	0.30( 0.30)	0.99	48257.4	12201.00
20	42787.81	115.96	0.988	0.30( 0.30)	0.99	49343.7	12111.00
21	42093.62	121.31	0.967	0.30( 0.30)	0.99	50713.1	12101.10
22	41541.03	125.32	0.956	0.30( 0.30)	0.99	51563.8	10400.00
23	39962.66	133.28	0.935	0.30( 0.30)	0.99	52875.9	12010.00
24	38627.37	139.15	0.920	0.30( 0.30)	0.99	53192.5	10210.00
25	38248.64	141.77	0.913	0.30( 0.30)	0.99	53301.4	12000.00
26	35056.16	165.11	0.853	0.30( 0.30)	0.99	53924.5	10100.00
TOTAL AREA(ACRES) =						53924.5	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 44407.00 Tc(MIN.) = 89.125  
 EFFECTIVE AREA(ACRES) = 37556.80 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 53924.5  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12901.00 TO NODE 12902.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM( FEET) = 216.00 DOWNSTREAM( FEET) = 215.00  
 CHANNEL LENGTH THRU SUBAREA( FEET) = 122.04 CHANNEL SLOPE = 0.0082  
 GIVEN CHANNEL BASE( FEET) = 200.00 CHANNEL FREEBOARD( FEET) = 0.0  
 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT( FEET) = 9.82  
 CHANNEL FLOW THRU SUBAREA( CFS) = 44407.00

FLOW VELOCITY(FEET/SEC.) = 18.16 FLOW DEPTH(FEET) = 9.82  
TRAVEL TIME(MIN.) = 0.11 Tc(MIN.) = 89.24  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12902.00 = 115038.03 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23610.42	13.11	3.309	0.30( 0.30)	0.99	3263.6	50200.00
2	27559.87	23.36	2.225	0.30( 0.30)	0.99	6320.4	50300.00
3	29591.50	28.99	1.935	0.30( 0.30)	0.99	7912.3	50120.00
4	29698.84	29.32	1.920	0.30( 0.30)	0.99	8000.4	40500.00
5	29854.32	29.75	1.900	0.30( 0.30)	0.99	8184.6	31200.00
6	29994.84	30.17	1.885	0.30( 0.30)	0.99	8354.5	50150.00
7	31257.90	33.78	1.792	0.30( 0.30)	0.99	9808.8	12710.00
8	31262.71	33.80	1.792	0.30( 0.30)	0.99	9818.3	50100.00
9	32048.08	37.53	1.696	0.30( 0.30)	0.99	11295.8	31810.00
10	32721.84	41.07	1.609	0.30( 0.30)	0.99	12760.2	31400.00
11	34103.38	48.94	1.435	0.30( 0.30)	0.99	15896.7	40100.00
12	36561.71	57.64	1.332	0.30( 0.30)	0.99	19241.0	11801.00
13	39217.50	67.17	1.260	0.30( 0.30)	0.99	23536.5	11530.00
14	41386.26	75.74	1.203	0.30( 0.30)	0.99	28520.3	11910.00
15	43423.56	82.89	1.155	0.30( 0.30)	0.99	33126.4	11330.00
16	44407.00	89.24	1.112	0.30( 0.30)	0.99	37556.8	11130.00
17	44206.89	96.82	1.076	0.30( 0.30)	0.99	41547.0	12330.00
18	43894.31	103.46	1.046	0.30( 0.30)	0.99	44890.1	12400.00
19	43284.12	112.12	1.006	0.30( 0.30)	0.99	48257.4	12201.00
20	42787.81	116.07	0.988	0.30( 0.30)	0.99	49343.7	12111.00
21	42093.62	121.42	0.966	0.30( 0.30)	0.99	50713.1	12101.10
22	41541.03	125.44	0.956	0.30( 0.30)	0.99	51563.8	10400.00
23	39962.66	133.40	0.935	0.30( 0.30)	0.99	52875.9	12010.00
24	38627.37	139.26	0.920	0.30( 0.30)	0.99	53192.5	10210.00
25	38248.64	141.88	0.913	0.30( 0.30)	0.99	53301.4	12000.00
26	35056.16	165.23	0.852	0.30( 0.30)	0.99	53924.5	10100.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 44407.00 Tc(MIN.) = 89.24  
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 37556.80

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12902.00 TO NODE 12902.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 1 <<<<<<  
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\*\*\*\*\*  
FLOW PROCESS FROM NODE 12902.00 TO NODE 12903.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 215.00 DOWNSTREAM(FEET) = 214.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 895.53 CHANNEL SLOPE = 0.0011  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 17.02  
CHANNEL FLOW THRU SUBAREA(CFS) = 44407.00  
FLOW VELOCITY(FEET/SEC.) = 9.15 FLOW DEPTH(FEET) = 17.02  
TRAVEL TIME(MIN.) = 1.63 Tc(MIN.) = 90.87

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23610.42	15.09	2.967	0.30( 0.30)	0.99	3263.6	50200.00
2	27559.87	25.24	2.105	0.30( 0.30)	0.99	6320.4	50300.00
3	29591.50	30.84	1.868	0.30( 0.30)	0.99	7912.3	50120.00
4	29698.84	31.16	1.859	0.30( 0.30)	0.99	8000.4	40500.00
5	29854.32	31.60	1.848	0.30( 0.30)	0.99	8184.6	31200.00
6	29994.84	32.01	1.838	0.30( 0.30)	0.99	8354.5	50150.00
7	31257.90	35.60	1.746	0.30( 0.30)	0.99	9808.8	12710.00
8	31262.71	35.62	1.745	0.30( 0.30)	0.99	9818.3	50100.00
9	32048.08	39.33	1.650	0.30( 0.30)	0.99	11295.8	31810.00
10	32721.84	42.86	1.570	0.30( 0.30)	0.99	12760.2	31400.00
11	34103.38	50.71	1.404	0.30( 0.30)	0.99	15896.7	40100.00
12	36561.71	59.37	1.315	0.30( 0.30)	0.99	19241.0	11801.00
13	39217.50	68.87	1.249	0.30( 0.30)	0.99	23536.5	11530.00
14	41386.26	77.40	1.191	0.30( 0.30)	0.99	28520.3	11910.00
15	43423.56	84.53	1.144	0.30( 0.30)	0.99	33126.4	11330.00
16	44407.00	90.87	1.103	0.30( 0.30)	0.99	37556.8	11130.00
17	44206.89	98.45	1.068	0.30( 0.30)	0.99	41547.0	12330.00
18	43894.31	105.10	1.038	0.30( 0.30)	0.99	44890.1	12400.00
19	43284.12	113.76	0.998	0.30( 0.30)	0.99	48257.4	12201.00
20	42787.81	117.72	0.980	0.30( 0.30)	0.99	49343.7	12111.00
21	42093.62	123.08	0.962	0.30( 0.30)	0.99	50713.1	12101.10
22	41541.03	127.10	0.952	0.30( 0.30)	0.99	51563.8	10400.00
23	39962.66	135.08	0.931	0.30( 0.30)	0.99	52875.9	12010.00
24	38627.37	140.96	0.915	0.30( 0.30)	0.99	53192.5	10210.00
25	38248.64	143.59	0.909	0.30( 0.30)	0.99	53301.4	12000.00
26	35056.16	166.98	0.848	0.30( 0.30)	0.99	53924.5	10100.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 44407.00 Tc(MIN.) = 90.87  
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 37556.80

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12902.00 TO NODE 12903.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 2 <<<<<<  
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\*\*\*\*\*  
FLOW PROCESS FROM NODE 12903.00 TO NODE 12903.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 2 <<<<<<  
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PEAK FLOWRATE TABLE FILE NAME: 0610504Y.DNA  
MEMORY BANK # 2 DEFINED AS FOLLOWS:  
STREAM Q Tc Fp(Fm) Ap Ae HEADWATER  
NUMBER (CFS) (MIN.) (INCH/HR) (ACRES) NODE  
1 161.41 16.37 0.30( 0.29) 0.97 70.7 50400.00  
TOTAL AREA(ACRES) = 70.7

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12903.00 TO NODE 12903.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<<

\*\*\*\*\*  
\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23610.42	15.09	2.967	0.30 ( 0.30)	0.99	3263.6	50200.00
2	27559.87	25.24	2.105	0.30 ( 0.30)	0.99	6320.4	50300.00
3	29591.50	30.84	1.868	0.30 ( 0.30)	0.99	7912.3	50120.00
4	29698.84	31.16	1.859	0.30 ( 0.30)	0.99	8000.4	40500.00
5	29854.32	31.60	1.848	0.30 ( 0.30)	0.99	8184.6	31200.00
6	29994.84	32.01	1.838	0.30 ( 0.30)	0.99	8354.5	50150.00
7	31257.90	35.60	1.746	0.30 ( 0.30)	0.99	9808.8	12710.00
8	31262.71	35.62	1.745	0.30 ( 0.30)	0.99	9818.3	50100.00
9	32048.08	39.33	1.650	0.30 ( 0.30)	0.99	11295.8	31810.00
10	32721.84	42.86	1.570	0.30 ( 0.30)	0.99	12760.2	31400.00
11	34103.38	50.71	1.404	0.30 ( 0.30)	0.99	15896.7	40100.00
12	36561.71	59.37	1.315	0.30 ( 0.30)	0.99	19241.0	11801.00
13	39217.50	68.87	1.249	0.30 ( 0.30)	0.99	23536.5	11530.00
14	41386.26	77.40	1.191	0.30 ( 0.30)	0.99	28520.3	11910.00
15	43423.56	84.53	1.144	0.30 ( 0.30)	0.99	33126.4	11330.00
16	44407.00	90.87	1.103	0.30 ( 0.30)	0.99	37556.8	11130.00
17	44206.89	98.45	1.068	0.30 ( 0.30)	0.99	41547.0	12330.00
18	43894.31	105.10	1.038	0.30 ( 0.30)	0.99	44890.1	12400.00
19	43284.12	113.76	0.998	0.30 ( 0.30)	0.99	48257.4	12201.00
20	42787.81	117.72	0.980	0.30 ( 0.30)	0.99	49343.7	12111.00
21	42093.62	123.08	0.962	0.30 ( 0.30)	0.99	50713.1	12101.10
22	41541.03	127.10	0.952	0.30 ( 0.30)	0.99	51563.8	10400.00
23	39962.66	135.08	0.931	0.30 ( 0.30)	0.99	52875.9	12010.00
24	38627.37	140.96	0.915	0.30 ( 0.30)	0.99	53192.5	10210.00
25	38248.64	143.59	0.909	0.30 ( 0.30)	0.99	53301.4	12000.00
26	35056.16	166.98	0.848	0.30 ( 0.30)	0.99	53924.5	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	161.41	16.37	2.832	0.30 ( 0.29)	0.97	70.7	50400.00

LONGEST FLOWPATH FROM NODE 50400.00 TO NODE 12903.00 = 3607.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23767.18	15.09	2.967	0.30 ( 0.30)	0.99	3328.7	50200.00
2	24268.94	16.37	2.832	0.30 ( 0.30)	0.99	3719.0	50400.00
3	27675.09	25.24	2.105	0.30 ( 0.30)	0.99	6391.1	50300.00
4	29691.64	30.84	1.868	0.30 ( 0.30)	0.99	7983.0	50120.00
5	29798.45	31.16	1.859	0.30 ( 0.30)	0.99	8071.1	40500.00
6	29953.22	31.60	1.848	0.30 ( 0.30)	0.99	8255.3	31200.00
7	30093.07	32.01	1.838	0.30 ( 0.30)	0.99	8425.2	50150.00
8	31350.29	35.60	1.746	0.30 ( 0.30)	0.99	9879.5	12710.00
9	31355.06	35.62	1.745	0.30 ( 0.30)	0.99	9889.0	50100.00
10	32134.40	39.33	1.650	0.30 ( 0.30)	0.99	11366.4	31810.00
11	32803.03	42.86	1.570	0.30 ( 0.30)	0.99	12830.9	31400.00
12	34174.03	50.71	1.404	0.30 ( 0.30)	0.99	15967.4	40100.00
13	36626.70	59.37	1.315	0.30 ( 0.30)	0.99	19311.7	11801.00
14	39278.29	68.87	1.249	0.30 ( 0.30)	0.99	23607.1	11530.00
15	41443.41	77.40	1.191	0.30 ( 0.30)	0.99	28590.9	11910.00
16	43477.68	84.53	1.144	0.30 ( 0.30)	0.99	33197.1	11330.00

17	44458.54	90.87	1.103	0.30 ( 0.30)	0.99	37627.5	11130.00
18	44256.23	98.45	1.068	0.30 ( 0.30)	0.99	41617.7	12330.00
19	43941.72	105.10	1.038	0.30 ( 0.30)	0.99	44960.8	12400.00
20	43329.01	113.76	0.998	0.30 ( 0.30)	0.99	48328.1	12201.00
21	42831.55	117.72	0.980	0.30 ( 0.30)	0.99	49414.4	12111.00
22	42136.19	123.08	0.962	0.30 ( 0.30)	0.99	50783.8	12101.10
23	41582.93	127.10	0.952	0.30 ( 0.30)	0.99	51634.5	10400.00
24	40003.25	135.08	0.931	0.30 ( 0.30)	0.99	52946.6	12010.00
25	38666.99	140.96	0.915	0.30 ( 0.30)	0.99	53263.2	10210.00
26	38287.82	143.59	0.909	0.30 ( 0.30)	0.99	53372.1	12000.00
27	35091.48	166.98	0.848	0.30 ( 0.30)	0.99	53995.2	10100.00

TOTAL AREA (ACRES) = 53995.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 44458.54 Tc (MIN.) = 90.869  
EFFECTIVE AREA (ACRES) = 37627.48 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 53995.2  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12903.00 TO NODE 12904.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM (FEET) = 214.00 DOWNSTREAM (FEET) = 213.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 767.57 CHANNEL SLOPE = 0.0013  
GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 16.34  
CHANNEL FLOW THRU SUBAREA (CFS) = 44458.54  
FLOW VELOCITY (FEET/SEC.) = 9.66 FLOW DEPTH (FEET) = 16.34  
TRAVEL TIME (MIN.) = 1.32 Tc (MIN.) = 92.19  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12904.00 = 116701.13 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23767.18	16.70	2.797	0.30 ( 0.30)	0.99	3328.7	50200.00
2	24268.94	17.97	2.662	0.30 ( 0.30)	0.99	3719.0	50400.00
3	27675.09	26.78	2.035	0.30 ( 0.30)	0.99	6391.1	50300.00
4	29691.64	32.34	1.829	0.30 ( 0.30)	0.99	7983.0	50120.00
5	29798.45	32.66	1.821	0.30 ( 0.30)	0.99	8071.1	40500.00
6	29953.22	33.09	1.810	0.30 ( 0.30)	0.99	8255.3	31200.00
7	30093.07	33.50	1.799	0.30 ( 0.30)	0.99	8425.2	50150.00
8	31350.29	37.07	1.708	0.30 ( 0.30)	0.99	9879.5	12710.00
9	31355.06	37.09	1.707	0.30 ( 0.30)	0.99	9889.0	50100.00
10	32134.40	40.79	1.615	0.30 ( 0.30)	0.99	11366.4	31810.00
11	32803.03	44.31	1.537	0.30 ( 0.30)	0.99	12830.9	31400.00
12	34174.03	52.14	1.389	0.30 ( 0.30)	0.99	15967.4	40100.00
13	36626.70	60.77	1.303	0.30 ( 0.30)	0.99	19311.7	11801.00
14	39278.29	70.24	1.239	0.30 ( 0.30)	0.99	23607.1	11530.00
15	41443.41	78.76	1.182	0.30 ( 0.30)	0.99	28590.9	11910.00
16	43477.68	85.86	1.135	0.30 ( 0.30)	0.99	33197.1	11330.00
17	44458.54	92.19	1.097	0.30 ( 0.30)	0.99	37627.5	11130.00
18	44256.23	99.78	1.062	0.30 ( 0.30)	0.99	41617.7	12330.00
19	43941.72	106.43	1.032	0.30 ( 0.30)	0.99	44960.8	12400.00

20	43329.01	115.10	0.992	0.30	( 0.30)	0.99	48328.1	12201.00
21	42831.55	119.06	0.974	0.30	( 0.30)	0.99	49414.4	12111.00
22	42136.19	124.43	0.958	0.30	( 0.30)	0.99	50783.8	12101.10
23	41582.93	128.45	0.948	0.30	( 0.30)	0.99	51634.5	10400.00
24	40003.25	136.45	0.927	0.30	( 0.30)	0.99	52946.6	12010.00
25	38666.99	142.35	0.912	0.30	( 0.30)	0.99	53263.2	10210.00
26	38287.82	144.98	0.905	0.30	( 0.30)	0.99	53372.1	12000.00
27	35091.48	168.41	0.844	0.30	( 0.30)	0.99	53995.2	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 44458.54 Tc(MIN.) = 92.19  
 AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 37627.48

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610311Y.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	179.31	26.98	0.30 ( 0.29)	0.97	114.8	31100.00
TOTAL AREA(ACRES) =						114.8

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23767.18	16.70	2.797	0.30 ( 0.30)	0.99	3328.7	50200.00
2	24268.94	17.97	2.662	0.30 ( 0.30)	0.99	3719.0	50400.00
3	27675.09	26.78	2.035	0.30 ( 0.30)	0.99	6391.1	50300.00
4	29691.64	32.34	1.829	0.30 ( 0.30)	0.99	7983.0	50120.00
5	29798.45	32.66	1.821	0.30 ( 0.30)	0.99	8071.1	40500.00
6	29953.22	33.09	1.810	0.30 ( 0.30)	0.99	8255.3	31200.00
7	30093.07	33.50	1.799	0.30 ( 0.30)	0.99	8425.2	50150.00
8	31350.29	37.07	1.708	0.30 ( 0.30)	0.99	9879.5	12710.00
9	31355.06	37.09	1.707	0.30 ( 0.30)	0.99	9889.0	50100.00
10	32134.40	40.79	1.615	0.30 ( 0.30)	0.99	11366.4	31810.00
11	32803.03	44.31	1.537	0.30 ( 0.30)	0.99	12830.9	31400.00
12	34174.03	52.14	1.389	0.30 ( 0.30)	0.99	15967.4	40100.00
13	36626.70	60.77	1.303	0.30 ( 0.30)	0.99	19311.7	11801.00
14	39278.29	70.24	1.239	0.30 ( 0.30)	0.99	23607.1	11530.00
15	41443.41	78.76	1.182	0.30 ( 0.30)	0.99	28590.9	11910.00
16	43477.68	85.86	1.135	0.30 ( 0.30)	0.99	33197.1	11330.00
17	44458.54	92.19	1.097	0.30 ( 0.30)	0.99	37627.5	11130.00
18	44256.23	99.78	1.062	0.30 ( 0.30)	0.99	41617.7	12330.00

19	43941.72	106.43	1.032	0.30	( 0.30)	0.99	44960.8	12400.00
20	43329.01	115.10	0.992	0.30	( 0.30)	0.99	48328.1	12201.00
21	42831.55	119.06	0.974	0.30	( 0.30)	0.99	49414.4	12111.00
22	42136.19	124.43	0.958	0.30	( 0.30)	0.99	50783.8	12101.10
23	41582.93	128.45	0.948	0.30	( 0.30)	0.99	51634.5	10400.00
24	40003.25	136.45	0.927	0.30	( 0.30)	0.99	52946.6	12010.00
25	38666.99	142.35	0.912	0.30	( 0.30)	0.99	53263.2	10210.00
26	38287.82	144.98	0.905	0.30	( 0.30)	0.99	53372.1	12000.00
27	35091.48	168.41	0.844	0.30	( 0.30)	0.99	53995.2	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12904.00 = 116701.13 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	179.31	26.98	2.026	0.30 ( 0.29)	0.97	114.8	31100.00
LONGEST FLOWPATH FROM NODE 31100.00 TO NODE 12904.00 = 6503.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23927.46	16.70	2.797	0.30 ( 0.30)	0.99	3399.8	50200.00
2	24432.14	17.97	2.662	0.30 ( 0.30)	0.99	3795.5	50400.00
3	27854.00	26.78	2.035	0.30 ( 0.30)	0.99	6505.1	50300.00
4	27926.46	26.98	2.026	0.30 ( 0.30)	0.99	6562.8	31100.00
5	29850.59	32.34	1.829	0.30 ( 0.30)	0.99	8097.8	50120.00
6	29956.55	32.66	1.821	0.30 ( 0.30)	0.99	8185.9	40500.00
7	30110.18	33.09	1.810	0.30 ( 0.30)	0.99	8370.1	31200.00
8	30248.94	33.50	1.799	0.30 ( 0.30)	0.99	8540.0	50150.00
9	31496.72	37.07	1.708	0.30 ( 0.30)	0.99	9994.3	12710.00
10	31501.43	37.09	1.707	0.30 ( 0.30)	0.99	10003.8	50100.00
11	32271.27	40.79	1.615	0.30 ( 0.30)	0.99	11481.3	31810.00
12	32931.82	44.31	1.537	0.30 ( 0.30)	0.99	12945.7	31400.00
13	34287.50	52.14	1.389	0.30 ( 0.30)	0.99	16082.2	40100.00
14	36731.28	60.77	1.303	0.30 ( 0.30)	0.99	19426.5	11801.00
15	39376.32	70.24	1.239	0.30 ( 0.30)	0.99	23721.9	11530.00
16	41535.55	78.76	1.182	0.30 ( 0.30)	0.99	28705.8	11910.00
17	43564.90	85.86	1.135	0.30 ( 0.30)	0.99	33311.9	11330.00
18	44541.86	92.19	1.097	0.30 ( 0.30)	0.99	37742.3	11130.00
19	44335.97	99.78	1.062	0.30 ( 0.30)	0.99	41732.5	12330.00
20	44018.33	106.43	1.032	0.30 ( 0.30)	0.99	45075.6	12400.00
21	43401.53	115.10	0.992	0.30 ( 0.30)	0.99	48442.9	12201.00
22	42902.20	119.06	0.974	0.30 ( 0.30)	0.99	49529.2	12111.00
23	42205.20	124.43	0.958	0.30 ( 0.30)	0.99	50898.6	12101.10
24	41650.87	128.45	0.948	0.30 ( 0.30)	0.99	51749.3	10400.00
25	40069.04	136.45	0.927	0.30 ( 0.30)	0.99	53061.4	12010.00
26	38731.19	142.35	0.912	0.30 ( 0.30)	0.99	53378.0	10210.00
27	38351.32	144.98	0.905	0.30 ( 0.30)	0.99	53486.9	12000.00
28	35148.69	168.41	0.844	0.30 ( 0.30)	0.99	54110.0	10100.00
TOTAL AREA(ACRES) =						54110.0	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 44541.86 Tc(MIN.) = 92.193  
 EFFECTIVE AREA(ACRES) = 37742.30 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 54110.0  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12904.00 = 116701.13 FEET.

=====  
 END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 54110.0 TC (MIN.) = 92.19  
 EFFECTIVE AREA (ACRES) = 37742.30 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.993  
 PEAK FLOW RATE (CFS) = 44541.86

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23927.46	16.70	2.797	0.30 ( 0.30)	0.99	3399.8	50200.00
2	24432.14	17.97	2.662	0.30 ( 0.30)	0.99	3795.5	50400.00
3	27854.00	26.78	2.035	0.30 ( 0.30)	0.99	6505.1	50300.00
4	27926.46	26.98	2.026	0.30 ( 0.30)	0.99	6562.8	31100.00
5	29850.59	32.34	1.829	0.30 ( 0.30)	0.99	8097.8	50120.00
6	29956.55	32.66	1.821	0.30 ( 0.30)	0.99	8185.9	40500.00
7	30110.18	33.09	1.810	0.30 ( 0.30)	0.99	8370.1	31200.00
8	30248.94	33.50	1.799	0.30 ( 0.30)	0.99	8540.0	50150.00
9	31496.72	37.07	1.708	0.30 ( 0.30)	0.99	9994.3	12710.00
10	31501.43	37.09	1.707	0.30 ( 0.30)	0.99	10003.8	50100.00
11	32271.27	40.79	1.615	0.30 ( 0.30)	0.99	11481.3	31810.00
12	32931.82	44.31	1.537	0.30 ( 0.30)	0.99	12945.7	31400.00
13	34287.50	52.14	1.389	0.30 ( 0.30)	0.99	16082.2	40100.00
14	36731.28	60.77	1.303	0.30 ( 0.30)	0.99	19426.5	11801.00
15	39376.32	70.24	1.239	0.30 ( 0.30)	0.99	23721.9	11530.00
16	41535.55	78.76	1.182	0.30 ( 0.30)	0.99	28705.8	11910.00
17	43564.90	85.86	1.135	0.30 ( 0.30)	0.99	33311.9	11330.00
18	44541.86	92.19	1.097	0.30 ( 0.30)	0.99	37742.3	11130.00
19	44335.97	99.78	1.062	0.30 ( 0.30)	0.99	41732.5	12330.00
20	44018.33	106.43	1.032	0.30 ( 0.30)	0.99	45075.6	12400.00
21	43401.53	115.10	0.992	0.30 ( 0.30)	0.99	48442.9	12201.00
22	42902.20	119.06	0.974	0.30 ( 0.30)	0.99	49529.2	12111.00
23	42205.20	124.43	0.958	0.30 ( 0.30)	0.99	50898.6	12101.10
24	41650.87	128.45	0.948	0.30 ( 0.30)	0.99	51749.3	10400.00
25	40069.04	136.45	0.927	0.30 ( 0.30)	0.99	53061.4	12010.00
26	38731.19	142.35	0.912	0.30 ( 0.30)	0.99	53378.0	10210.00
27	38351.32	144.98	0.905	0.30 ( 0.30)	0.99	53486.9	12000.00
28	35148.69	168.41	0.844	0.30 ( 0.30)	0.99	54110.0	10100.00

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

Analysis prepared by:

FILE NAME: S30.DAT
TIME/DATE OF STUDY: 11:54 04/03/2013

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 4.800
2) 10.00; 3.258
3) 15.00; 2.590
4) 20.00; 2.201
5) 25.00; 1.940
6) 30.00; 1.740
7) 40.00; 1.487
8) 50.00; 1.310
9) 60.00; 1.150
10) 90.00; 0.940
11) 120.00; 0.798
12) 180.00; 0.647
13) 360.00; 0.452
14) 1440.00; 0.187

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*
Table with columns: NO., WIDTH (FT), CROSSFALL (FT), IN- / SIDE, OUT- / SIDE, / WAY, CURB HEIGHT (FT), GUTTER WIDTH (FT), LIP (FT), GEOMETRIES HIKE (FT), MANNING FACTOR (n)

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 13000.00 TO NODE 13001.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 279.24
ELEVATION DATA: UPSTREAM(FEET) = 1187.54 DOWNSTREAM(FEET) = 1104.45

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.560
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.702
SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)
NATURAL FAIR COVER
"OPEN BRUSH" - 0.65 0.30 1.000 0 8.56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 1.99
TOTAL AREA (ACRES) = 0.65 PEAK FLOW RATE (CFS) = 1.99

\*\*\*\*\*

FLOW PROCESS FROM NODE 13001.00 TO NODE 13002.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1104.45 DOWNSTREAM(FEET) = 1034.82
CHANNEL LENGTH THRU SUBAREA(FEET) = 736.73 CHANNEL SLOPE = 0.0945
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.39
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.224
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN
USER-DEFINED - 19.74 0.30 0.968 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.968
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 28.15
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.26
AVERAGE FLOW DEPTH(FEET) = 0.36 TRAVEL TIME(MIN.) = 1.69
Tc(MIN.) = 10.25
SUBAREA AREA(ACRES) = 19.74 SUBAREA RUNOFF(CFS) = 52.13
EFFECTIVE AREA(ACRES) = 20.39 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 20.4 PEAK FLOW RATE(CFS) = 53.84
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.53

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.53 FLOW VELOCITY(FEET/SEC.) = 9.20
LONGEST FLOWPATH FROM NODE 13000.00 TO NODE 13002.00 = 1015.97 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13002.00 TO NODE 13003.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1034.82 DOWNSTREAM(FEET) = 986.71  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1305.95 CHANNEL SLOPE = 0.0368  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.32

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.922

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	83.90	0.30	0.904	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.904

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 154.17

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.62

AVERAGE FLOW DEPTH(FEET) = 1.28 TRAVEL TIME(MIN.) = 2.26

Tc(MIN.) = 12.51

SUBAREA AREA(ACRES) = 83.90 SUBAREA RUNOFF(CFS) = 200.18

EFFECTIVE AREA(ACRES) = 104.29 AREA-AVERAGED Fm(INCH/HR) = 0.27

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.92

TOTAL AREA(ACRES) = 104.3 PEAK FLOW RATE(CFS) = 248.47

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.67

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.67 FLOW VELOCITY(FEET/SEC.) = 11.17

LONGEST FLOWPATH FROM NODE 13000.00 TO NODE 13003.00 = 2321.92 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13003.00 TO NODE 13004.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 986.71 DOWNSTREAM(FEET) = 939.06  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1318.54 CHANNEL SLOPE = 0.0361  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.88

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.673

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	47.44	0.30	0.871	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.871

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 299.95

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.76

AVERAGE FLOW DEPTH(FEET) = 1.86 TRAVEL TIME(MIN.) = 1.87

Tc(MIN.) = 14.38

SUBAREA AREA(ACRES) = 47.44 SUBAREA RUNOFF(CFS) = 102.95

EFFECTIVE AREA(ACRES) = 151.73 AREA-AVERAGED Fm(INCH/HR) = 0.27

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.90

TOTAL AREA(ACRES) = 151.7 PEAK FLOW RATE(CFS) = 328.00

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.96

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.96 FLOW VELOCITY(FEET/SEC.) = 12.05

LONGEST FLOWPATH FROM NODE 13000.00 TO NODE 13004.00 = 3640.46 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13004.00 TO NODE 13020.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 939.06 DOWNSTREAM(FEET) = 861.53  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1954.61 CHANNEL SLOPE = 0.0397  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.16

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.447

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	77.87	0.30	0.856	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.856

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 404.79

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.25

AVERAGE FLOW DEPTH(FEET) = 2.14 TRAVEL TIME(MIN.) = 2.46

Tc(MIN.) = 16.84

SUBAREA AREA(ACRES) = 77.87 SUBAREA RUNOFF(CFS) = 153.49

EFFECTIVE AREA(ACRES) = 229.60 AREA-AVERAGED Fm(INCH/HR) = 0.27

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.89

TOTAL AREA(ACRES) = 229.6 PEAK FLOW RATE(CFS) = 450.66

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.26

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.26 FLOW VELOCITY(FEET/SEC.) = 13.71

LONGEST FLOWPATH FROM NODE 13000.00 TO NODE 13020.00 = 5595.07 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13004.00 TO NODE 13020.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 16.84

RAINFALL INTENSITY(INCH/HR) = 2.45

AREA-AVERAGED Fm(INCH/HR) = 0.27

AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.89

EFFECTIVE STREAM AREA(ACRES) = 229.60

TOTAL STREAM AREA(ACRES) = 229.60

PEAK FLOW RATE(CFS) AT CONFLUENCE = 450.66

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FLOW PROCESS FROM NODE 13010.00 TO NODE 13011.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
-----
INITIAL SUBAREA FLOW-LENGTH(FEET) = 284.64
ELEVATION DATA: UPSTREAM(FEET) = 1190.91 DOWNSTREAM(FEET) = 1110.50

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.716
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.654
SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp        Ap      SCS   Tc
LAND USE            GROUP   (ACRES)  (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"OPEN BRUSH"        -         0.91     0.30     1.000    0     8.72
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 2.75
TOTAL AREA(ACRES) = 0.91 PEAK FLOW RATE(CFS) = 2.75

*****
FLOW PROCESS FROM NODE 13011.00 TO NODE 13012.00 IS CODE = 62
-----
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<
-----
UPSTREAM ELEVATION(FEET) = 1110.50 DOWNSTREAM ELEVATION(FEET) = 1068.16
STREET LENGTH(FEET) = 581.12 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 30.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.018
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.018

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.53
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.36
HALFSTREET FLOOD WIDTH(FEET) = 11.21
AVERAGE FLOW VELOCITY(FEET/SEC.) = 6.28
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.28
STREET FLOW TRAVEL TIME(MIN.) = 1.54 Tc(MIN.) = 10.26
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.223
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp        Ap      SCS
LAND USE            GROUP   (ACRES)  (INCH/HR) (DECIMAL) CN
USER-DEFINED        -         10.46    0.30     1.000    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA AREA(ACRES) = 10.46 SUBAREA RUNOFF(CFS) = 27.52
EFFECTIVE AREA(ACRES) = 11.37 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

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TOTAL AREA(ACRES) = 11.4 PEAK FLOW RATE(CFS) = 29.92

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.42 HALFSTREET FLOOD WIDTH(FEET) = 14.57
FLOW VELOCITY(FEET/SEC.) = 7.16 DEPTH*VELOCITY(FT*FT/SEC.) = 3.03
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13012.00 = 865.76 FEET.

*****
FLOW PROCESS FROM NODE 13012.00 TO NODE 13013.00 IS CODE = 62
-----
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<
-----
UPSTREAM ELEVATION(FEET) = 1068.16 DOWNSTREAM ELEVATION(FEET) = 994.58
STREET LENGTH(FEET) = 1505.98 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 30.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.018
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.018

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 70.16
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.56
HALFSTREET FLOOD WIDTH(FEET) = 22.30
AVERAGE FLOW VELOCITY(FEET/SEC.) = 7.57
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.24
STREET FLOW TRAVEL TIME(MIN.) = 3.32 Tc(MIN.) = 13.58
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.780
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp        Ap      SCS
LAND USE            GROUP   (ACRES)  (INCH/HR) (DECIMAL) CN
USER-DEFINED        -         35.49    0.30     0.901    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.901
SUBAREA AREA(ACRES) = 35.49 SUBAREA RUNOFF(CFS) = 80.17
EFFECTIVE AREA(ACRES) = 46.86 AREA-AVERAGED Fm(INCH/HR) = 0.28
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.93
TOTAL AREA(ACRES) = 46.9 PEAK FLOW RATE(CFS) = 105.55

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.63 HALFSTREET FLOOD WIDTH(FEET) = 26.21
FLOW VELOCITY(FEET/SEC.) = 8.34 DEPTH*VELOCITY(FT*FT/SEC.) = 5.26
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13013.00 = 2371.74 FEET.

*****
FLOW PROCESS FROM NODE 13013.00 TO NODE 13014.00 IS CODE = 56
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 994.58 DOWNSTREAM(FEET) = 944.96
CHANNEL LENGTH THRU SUBAREA(FEET) = 1798.86 CHANNEL SLOPE = 0.0276

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GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.55  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.446  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	73.31	0.30	0.616	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.616  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 180.28  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.14  
 AVERAGE FLOW DEPTH (FEET) = 1.51 TRAVEL TIME (MIN.) = 3.28  
 Tc (MIN.) = 16.86  
 SUBAREA AREA (ACRES) = 73.31 SUBAREA RUNOFF (CFS) = 149.17  
 EFFECTIVE AREA (ACRES) = 120.17 AREA-AVERAGED Fm (INCH/HR) = 0.22  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.74  
 TOTAL AREA (ACRES) = 120.2 PEAK FLOW RATE (CFS) = 240.62  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.77

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.77 FLOW VELOCITY (FEET/SEC.) = 10.01  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13014.00 = 4170.60 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13014.00 TO NODE 13020.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 944.96 DOWNSTREAM (FEET) = 861.53  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1519.40 CHANNEL SLOPE = 0.0549  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.72  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.303  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	80.22	0.30	0.810	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.810  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 315.00  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 13.79  
 AVERAGE FLOW DEPTH (FEET) = 1.70 TRAVEL TIME (MIN.) = 1.84  
 Tc (MIN.) = 18.69  
 SUBAREA AREA (ACRES) = 80.22 SUBAREA RUNOFF (CFS) = 148.71  
 EFFECTIVE AREA (ACRES) = 200.39 AREA-AVERAGED Fm (INCH/HR) = 0.23  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.77  
 TOTAL AREA (ACRES) = 200.4 PEAK FLOW RATE (CFS) = 373.87  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.87

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.87 FLOW VELOCITY (FEET/SEC.) = 14.53

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13020.00 = 5690.00 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13014.00 TO NODE 13020.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION (MIN.) = 18.69  
 RAINFALL INTENSITY (INCH/HR) = 2.30  
 AREA-AVERAGED Fm (INCH/HR) = 0.23  
 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.77  
 EFFECTIVE STREAM AREA (ACRES) = 200.39  
 TOTAL STREAM AREA (ACRES) = 200.39  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 373.87

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	450.66	16.84	2.447	0.30 ( 0.27)	0.89	229.6	13000.00
2	373.87	18.69	2.303	0.30 ( 0.23)	0.77	200.4	13010.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	810.90	16.84	2.447	0.30 ( 0.25)	0.83	410.1	13000.00
2	794.76	18.69	2.303	0.30 ( 0.25)	0.83	430.0	13010.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE (CFS) = 810.90 Tc (MIN.) = 16.84  
 EFFECTIVE AREA (ACRES) = 410.14 AREA-AVERAGED Fm (INCH/HR) = 0.25  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83  
 TOTAL AREA (ACRES) = 430.0  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13020.00 = 5690.00 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13020.00 TO NODE 13021.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 861.53 DOWNSTREAM (FEET) = 843.84  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1274.71 CHANNEL SLOPE = 0.0139  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.91  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.249  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	80.78	0.30	0.818	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.818  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 883.74  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.34  
 AVERAGE FLOW DEPTH(FEET) = 1.90 TRAVEL TIME(MIN.) = 2.55  
 Tc(MIN.) = 19.39  
 SUBAREA AREA(ACRES) = 80.78 SUBAREA RUNOFF(CFS) = 145.64  
 EFFECTIVE AREA(ACRES) = 490.92 AREA-AVERAGED Fm(INCH/HR) = 0.25  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83  
 TOTAL AREA(ACRES) = 510.8 PEAK FLOW RATE(CFS) = 883.37  
 GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.90

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.90 FLOW VELOCITY(FEET/SEC.) = 8.33  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13021.00 = 6964.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	883.37	19.39	2.249	0.30( 0.25)	0.83	490.9	13000.00
2	867.41	21.26	2.135	0.30( 0.25)	0.83	510.8	13010.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 883.37 Tc(MIN.) = 19.39  
 AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.83 EFFECTIVE AREA(ACRES) = 490.92

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13021.00 TO NODE 13022.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====  
 ELEVATION DATA: UPSTREAM(FEET) = 843.84 DOWNSTREAM(FEET) = 842.14  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1448.62 CHANNEL SLOPE = 0.0012  
 GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.15  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.911  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	124.44	0.30	0.803	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.803  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 977.00  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.81  
 AVERAGE FLOW DEPTH(FEET) = 4.11 TRAVEL TIME(MIN.) = 6.33  
 Tc(MIN.) = 25.72  
 SUBAREA AREA(ACRES) = 124.44 SUBAREA RUNOFF(CFS) = 187.08  
 EFFECTIVE AREA(ACRES) = 615.36 AREA-AVERAGED Fm(INCH/HR) = 0.25  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83  
 TOTAL AREA(ACRES) = 635.2 PEAK FLOW RATE(CFS) = 921.42  
 GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.98

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.98 FLOW VELOCITY(FEET/SEC.) = 3.74  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13022.00 = 8413.33 FEET.

\*\* PEAK FLOW RATE TABLE \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	921.42	25.72	1.911	0.30( 0.25)	0.83	615.4	13000.00
2	907.73	27.63	1.835	0.30( 0.25)	0.82	635.2	13010.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 921.42 Tc(MIN.) = 25.72  
 AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.83 EFFECTIVE AREA(ACRES) = 615.36

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13022.00 TO NODE 13023.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====  
 ELEVATION DATA: UPSTREAM(FEET) = 842.14 DOWNSTREAM(FEET) = 806.85  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1432.95 CHANNEL SLOPE = 0.0246  
 GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.89  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.825  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	324.46	0.30	0.786	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.786  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1153.47  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.03  
 AVERAGE FLOW DEPTH(FEET) = 1.88 TRAVEL TIME(MIN.) = 2.17  
 Tc(MIN.) = 27.88  
 SUBAREA AREA(ACRES) = 324.46 SUBAREA RUNOFF(CFS) = 463.99  
 EFFECTIVE AREA(ACRES) = 939.82 AREA-AVERAGED Fm(INCH/HR) = 0.24  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.81  
 TOTAL AREA(ACRES) = 959.7 PEAK FLOW RATE(CFS) = 1337.45  
 GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.05

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.05 FLOW VELOCITY(FEET/SEC.) = 11.62  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13023.00 = 9846.28 FEET.

\*\* PEAK FLOW RATE TABLE \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1337.45	27.88	1.825	0.30( 0.24)	0.81	939.8	13000.00
2	1299.23	29.81	1.747	0.30( 0.24)	0.81	959.7	13010.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 1337.45 Tc(MIN.) = 27.88  
 AREA-AVERAGED Fm(INCH/HR) = 0.24 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.81 EFFECTIVE AREA(ACRES) = 939.82

\*\*\*\*\*

FLOW PROCESS FROM NODE 13023.00 TO NODE 13024.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 806.85 DOWNSTREAM(FEET) = 767.07
CHANNEL LENGTH THRU SUBAREA(FEET) = 940.17 CHANNEL SLOPE = 0.0423
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.94
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.782

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 367.12 0.30 0.795 -

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.795

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1592.48

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.75

AVERAGE FLOW DEPTH(FEET) = 1.94 TRAVEL TIME(MIN.) = 1.06

Tc(MIN.) = 28.95

SUBAREA AREA(ACRES) = 367.12 SUBAREA RUNOFF(CFS) = 510.06

EFFECTIVE AREA(ACRES) = 1306.94 AREA-AVERAGED Fm(INCH/HR) = 0.24

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.81

TOTAL AREA(ACRES) = 1326.8 PEAK FLOW RATE(CFS) = 1811.56

GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.09

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.09 FLOW VELOCITY(FEET/SEC.) = 15.42

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13024.00 = 10786.45 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 1811.56 28.95 1.782 0.30( 0.24) 0.81 1306.9 13000.00
2 1762.04 30.89 1.717 0.30( 0.24) 0.81 1326.8 13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1811.56 Tc(MIN.) = 28.95

AREA-AVERAGED Fm(INCH/HR) = 0.24 AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.81 EFFECTIVE AREA(ACRES) = 1306.94

\*\*\*\*\*
FLOW PROCESS FROM NODE 13024.00 TO NODE 13025.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 767.07 DOWNSTREAM(FEET) = 697.38
CHANNEL LENGTH THRU SUBAREA(FEET) = 3026.62 CHANNEL SLOPE = 0.0230
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.67
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.669

SUBAREA LOSS RATE DATA(AMC II):

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

USER-DEFINED - 315.24 0.30 0.867 -

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.867

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2011.50

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.10

AVERAGE FLOW DEPTH(FEET) = 2.65 TRAVEL TIME(MIN.) = 3.85

Tc(MIN.) = 32.80

SUBAREA AREA(ACRES) = 315.24 SUBAREA RUNOFF(CFS) = 399.81

EFFECTIVE AREA(ACRES) = 1622.18 AREA-AVERAGED Fm(INCH/HR) = 0.25

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.82

TOTAL AREA(ACRES) = 1642.0 PEAK FLOW RATE(CFS) = 2078.52

GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.70

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.70 FLOW VELOCITY(FEET/SEC.) = 13.26

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13025.00 = 13813.07 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 2078.52 32.80 1.669 0.30( 0.25) 0.82 1622.2 13000.00
2 2030.15 34.78 1.619 0.30( 0.25) 0.82 1642.0 13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 2078.52 Tc(MIN.) = 32.80

AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.82 EFFECTIVE AREA(ACRES) = 1622.18

\*\*\*\*\*

FLOW PROCESS FROM NODE 13025.00 TO NODE 13026.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 697.38 DOWNSTREAM(FEET) = 662.66
CHANNEL LENGTH THRU SUBAREA(FEET) = 2362.69 CHANNEL SLOPE = 0.0147
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.27
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.585

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 374.11 0.30 0.748 -

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.748

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2307.62

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.83

AVERAGE FLOW DEPTH(FEET) = 3.26 TRAVEL TIME(MIN.) = 3.33

Tc(MIN.) = 36.13

SUBAREA AREA(ACRES) = 374.11 SUBAREA RUNOFF(CFS) = 458.14

EFFECTIVE AREA(ACRES) = 1996.29 AREA-AVERAGED Fm(INCH/HR) = 0.24

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.81

TOTAL AREA(ACRES) = 2016.1 PEAK FLOW RATE(CFS) = 2413.71

GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.35

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.35 FLOW VELOCITY(FEET/SEC.) = 11.99  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13026.00 = 16175.76 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2413.71	36.13	1.585	0.30( 0.24)	0.81	1996.3	13000.00
2	2345.64	38.14	1.534	0.30( 0.24)	0.81	2016.1	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 2413.71 Tc(MIN.) = 36.13  
AREA-AVERAGED Fm(INCH/HR) = 0.24 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.81 EFFECTIVE AREA(ACRES) = 1996.29

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 2016.1 TC(MIN.) = 36.13  
EFFECTIVE AREA(ACRES) = 1996.29 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.805  
PEAK FLOW RATE(CFS) = 2413.71

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2413.71	36.13	1.585	0.30( 0.24)	0.81	1996.3	13000.00
2	2345.64	38.14	1.534	0.30( 0.24)	0.81	2016.1	13010.00

=====  
END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*

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

Analysis prepared by:

-----  
FILE NAME: S31.DAT  
TIME/DATE OF STUDY: 11:54 04/03/2013  
=====

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-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 4.800
- 2) 10.00; 3.258
- 3) 15.00; 2.590
- 4) 20.00; 2.201
- 5) 25.00; 1.940
- 6) 30.00; 1.740
- 7) 40.00; 1.487
- 8) 50.00; 1.310
- 9) 60.00; 1.150
- 10) 90.00; 0.940
- 11) 120.00; 0.798
- 12) 180.00; 0.647
- 13) 360.00; 0.452
- 14) 1440.00; 0.187

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	STREETS FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:  
1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)  
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13100.00 TO NODE 13101.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 282.58  
ELEVATION DATA: UPSTREAM(FEET) = 1069.66 DOWNSTREAM(FEET) = 969.92

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.312  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.779  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCSSOIL AREA Fp Ap SCSS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"OPEN BRUSH" - 0.94 0.30 1.000 0 8.31  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 2.94  
TOTAL AREA(ACRES) = 0.94 PEAK FLOW RATE(CFS) = 2.94

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13101.00 TO NODE 13102.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 969.92 DOWNSTREAM(FEET) = 807.20  
CHANNEL LENGTH THRU SUBAREA(FEET) = 665.89 CHANNEL SLOPE = 0.2444  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.28  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.174  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCSSOIL AREA Fp Ap SCSS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 7.67 0.30 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.92  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.79  
AVERAGE FLOW DEPTH(FEET) = 0.26 TRAVEL TIME(MIN.) = 2.32  
Tc(MIN.) = 10.63  
SUBAREA AREA(ACRES) = 7.67 SUBAREA RUNOFF(CFS) = 19.84  
EFFECTIVE AREA(ACRES) = 8.61 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 8.6 PEAK FLOW RATE(CFS) = 22.27  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.36

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.36 FLOW VELOCITY(FEET/SEC.) = 5.85  
LONGEST FLOWPATH FROM NODE 13100.00 TO NODE 13102.00 = 948.47 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13102.00 TO NODE 13103.00 IS CODE = 56  
=====

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	807.20	DOWNSTREAM(FEET) =	769.94
CHANNEL LENGTH THRU SUBAREA(FEET) =	691.01	CHANNEL SLOPE =	0.0539
GIVEN CHANNEL BASE(FEET) =	10.00	CHANNEL FREEBOARD(FEET) =	0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.88  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.841

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	20.65	0.30	0.999	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.999

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 45.95

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.62

AVERAGE FLOW DEPTH(FEET) = 0.85 TRAVEL TIME(MIN.) = 2.49

Tc(MIN.) = 13.12

SUBAREA AREA(ACRES) = 20.65 SUBAREA RUNOFF(CFS) = 47.23

EFFECTIVE AREA(ACRES) = 29.26 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 29.3 PEAK FLOW RATE(CFS) = 66.93

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.06

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.06 FLOW VELOCITY(FEET/SEC.) = 5.23

LONGEST FLOWPATH FROM NODE 13100.00 TO NODE 13103.00 = 1639.48 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13103.00 TO NODE 13104.00 IS CODE = 31

-----  
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	769.94	DOWNSTREAM(FEET) =	693.88
FLOW LENGTH(FEET) =	1563.10	MANNING'S N =	0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO	36.000		

DEPTH OF FLOW IN 36.0 INCH PIPE IS 17.6 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 19.54

ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) = 66.93

PIPE TRAVEL TIME(MIN.) = 1.33 Tc(MIN.) = 14.45

LONGEST FLOWPATH FROM NODE 13100.00 TO NODE 13104.00 = 3202.58 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13103.00 TO NODE 13104.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN.) = 14.45

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.663

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
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USER-DEFINED	-	28.00	0.30	0.750	-
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SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.750  
SUBAREA AREA(ACRES) = 28.00 SUBAREA RUNOFF(CFS) = 61.44  
EFFECTIVE AREA(ACRES) = 57.26 AREA-AVERAGED Fm(INCH/HR) = 0.26  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.88  
TOTAL AREA(ACRES) = 57.3 PEAK FLOW RATE(CFS) = 123.67

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13104.00 TO NODE 13105.00 IS CODE = 31

-----  
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	693.88	DOWNSTREAM(FEET) =	645.69
FLOW LENGTH(FEET) =	1068.98	MANNING'S N =	0.013
DEPTH OF FLOW IN 36.0 INCH PIPE IS	27.2 INCHES		

PIPE-FLOW VELOCITY(FEET/SEC.) = 21.57

ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) = 123.67

PIPE TRAVEL TIME(MIN.) = 0.83 Tc(MIN.) = 15.28

LONGEST FLOWPATH FROM NODE 13100.00 TO NODE 13105.00 = 4271.56 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13104.00 TO NODE 13105.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN.) = 15.28

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.568

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	35.28	0.30	0.867	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.867

SUBAREA AREA(ACRES) = 35.28 SUBAREA RUNOFF(CFS) = 73.29

EFFECTIVE AREA(ACRES) = 92.54 AREA-AVERAGED Fm(INCH/HR) = 0.26

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.87

TOTAL AREA(ACRES) = 92.5 PEAK FLOW RATE(CFS) = 192.08

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13105.00 TO NODE 13106.00 IS CODE = 31

-----  
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	645.69	DOWNSTREAM(FEET) =	608.48
FLOW LENGTH(FEET) =	1127.55	MANNING'S N =	0.013
DEPTH OF FLOW IN 45.0 INCH PIPE IS	34.1 INCHES		

PIPE-FLOW VELOCITY(FEET/SEC.) = 21.41

ESTIMATED PIPE DIAMETER(INCH) = 45.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) = 192.08

PIPE TRAVEL TIME(MIN.) = 0.88 Tc(MIN.) = 16.16

LONGEST FLOWPATH FROM NODE 13100.00 TO NODE 13106.00 = 5399.11 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13105.00 TO NODE 13106.00 IS CODE = 81

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

MAINLINE Tc(MIN.) = 16.16  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.500  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 37.68 0.30 0.889 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.889  
SUBAREA AREA(ACRES) = 37.68 SUBAREA RUNOFF(CFS) = 75.74  
EFFECTIVE AREA(ACRES) = 130.22 AREA-AVERAGED Fm(INCH/HR) = 0.26  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.88  
TOTAL AREA(ACRES) = 130.2 PEAK FLOW RATE(CFS) = 262.13

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13105.00 TO NODE 13106.00 IS CODE = 10  
-----

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

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13025.00 TO NODE 13026.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: S30.DNA  
MEMORY BANK # 2 DEFINED AS FOLLOWS:  
STREAM Q Tc Fp(Fm) Ap Ae HEADWATER  
NUMBER (CFS) (MIN.) (INCH/HR) (ACRES) NODE  
1 2413.71 36.13 0.30( 0.24) 0.81 1996.3 13000.00  
2 2345.64 38.14 0.30( 0.24) 0.81 2016.1 13010.00  
TOTAL AREA(ACRES) = 2016.1

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13025.00 TO NODE 13026.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2413.71	36.13	0.30( 0.24)	0.81	1996.3	13000.00
2	2345.64	38.14	0.30( 0.24)	0.81	2016.1	13010.00
TOTAL AREA(ACRES) = 2016.1						

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13026.00 TO NODE 13106.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 662.66 DOWNSTREAM(FEET) = 608.48  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3098.88 CHANNEL SLOPE = 0.0175  
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.22  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.484  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 75.28 0.30 0.755 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.755  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2456.32  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.80  
AVERAGE FLOW DEPTH(FEET) = 3.22 TRAVEL TIME(MIN.) = 4.03  
Tc(MIN.) = 40.16  
SUBAREA AREA(ACRES) = 75.28 SUBAREA RUNOFF(CFS) = 85.21  
EFFECTIVE AREA(ACRES) = 2071.57 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.80  
TOTAL AREA(ACRES) = 2091.4 PEAK FLOW RATE(CFS) = 2413.71  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.19

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.19 FLOW VELOCITY(FEET/SEC.) = 12.72  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13106.00 = 19274.64 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2413.71	40.16	1.484	0.30( 0.24)	0.80	2071.6	13000.00
2	2345.64	42.22	1.448	0.30( 0.24)	0.80	2091.4	13010.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 2413.71 Tc(MIN.) = 40.16  
AREA-AVERAGED Fm(INCH/HR) = 0.24 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.80 EFFECTIVE AREA(ACRES) = 2071.57

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13105.00 TO NODE 13106.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2413.71	40.16	1.484	0.30( 0.24)	0.80	2071.6	13000.00
2	2345.64	42.22	1.448	0.30( 0.24)	0.80	2091.4	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13106.00 = 19274.64 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	262.13	16.16	2.500	0.30( 0.26)	0.88	130.2	13100.00

LONGEST FLOWPATH FROM NODE 13100.00 TO NODE 13106.00 = 5399.11 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2026.72	16.16	2.500	0.30( 0.24)	0.81	963.7	13100.00

2 2556.79 40.16 1.484 0.30( 0.24) 0.81 2201.8 13000.00  
 3 2484.46 42.22 1.448 0.30( 0.24) 0.81 2221.6 13010.00  
 TOTAL AREA (ACRES) = 2221.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 2556.79 Tc (MIN.) = 40.160  
 EFFECTIVE AREA (ACRES) = 2201.79 AREA-AVERAGED Fm (INCH/HR) = 0.24  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.81  
 TOTAL AREA (ACRES) = 2221.6  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13106.00 = 19274.64 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13106.00 TO NODE 13107.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 608.48 DOWNSTREAM (FEET) = 584.29  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1650.20 CHANNEL SLOPE = 0.0147  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.55

\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.445

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	190.45	0.30	0.755	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.755

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2661.22

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.38

AVERAGE FLOW DEPTH (FEET) = 3.54 TRAVEL TIME (MIN.) = 2.22

Tc (MIN.) = 42.38

SUBAREA AREA (ACRES) = 190.45 SUBAREA RUNOFF (CFS) = 208.84

EFFECTIVE AREA (ACRES) = 2392.24 AREA-AVERAGED Fm (INCH/HR) = 0.24

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.80

TOTAL AREA (ACRES) = 2412.1 PEAK FLOW RATE (CFS) = 2591.73

GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.49

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 3.49 FLOW VELOCITY (FEET/SEC.) = 12.27

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13107.00 = 20924.84 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap (ACRES)	Ae (ACRES)	HEADWATER NODE
1	2155.16	18.52	2.316	0.30( 0.24)	0.80	1154.1	13100.00
2	2591.73	42.38	1.445	0.30( 0.24)	0.80	2392.2	13000.00
3	2533.72	44.46	1.408	0.30( 0.24)	0.80	2412.1	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 2591.73 Tc (MIN.) = 42.38

AREA-AVERAGED Fm (INCH/HR) = 0.24 AREA-AVERAGED Fp (INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.80 EFFECTIVE AREA (ACRES) = 2392.24

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13107.00 TO NODE 13108.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 584.29 DOWNSTREAM (FEET) = 563.78  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1061.67 CHANNEL SLOPE = 0.0193  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.34

\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.422

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	314.12	0.30	0.939	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.939

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2752.93

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 13.74

AVERAGE FLOW DEPTH (FEET) = 3.34 TRAVEL TIME (MIN.) = 1.29

Tc (MIN.) = 43.67

SUBAREA AREA (ACRES) = 314.12 SUBAREA RUNOFF (CFS) = 322.40

EFFECTIVE AREA (ACRES) = 2706.36 AREA-AVERAGED Fm (INCH/HR) = 0.25

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.82

TOTAL AREA (ACRES) = 2726.2 PEAK FLOW RATE (CFS) = 2865.05

GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.42

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 3.42 FLOW VELOCITY (FEET/SEC.) = 13.93

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13108.00 = 21986.51 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap (ACRES)	Ae (ACRES)	HEADWATER NODE
1	2592.15	19.87	2.211	0.30( 0.25)	0.83	1468.2	13100.00
2	2865.05	43.67	1.422	0.30( 0.25)	0.82	2706.4	13000.00
3	2795.85	45.75	1.385	0.30( 0.25)	0.82	2726.2	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 2865.05 Tc (MIN.) = 43.67

AREA-AVERAGED Fm (INCH/HR) = 0.25 AREA-AVERAGED Fp (INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.82 EFFECTIVE AREA (ACRES) = 2706.36

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13108.00 TO NODE 13109.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 563.78 DOWNSTREAM (FEET) = 541.61  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1657.28 CHANNEL SLOPE = 0.0134  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.87

\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.383

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
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USER-DEFINED - 203.63 0.30 0.785 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.785  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2970.19  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.45  
 AVERAGE FLOW DEPTH (FEET) = 3.87 TRAVEL TIME (MIN.) = 2.22  
 Tc (MIN.) = 45.89  
 SUBAREA AREA (ACRES) = 203.63 SUBAREA RUNOFF (CFS) = 210.27  
 EFFECTIVE AREA (ACRES) = 2909.99 AREA-AVERAGED Fm (INCH/HR) = 0.25  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.82  
 TOTAL AREA (ACRES) = 2929.8 PEAK FLOW RATE (CFS) = 2979.64  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 3.88

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 3.88 FLOW VELOCITY (FEET/SEC.) = 12.46  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13109.00 = 23643.79 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2770.50	22.14	2.089	0.30 (0.25)	0.83	1671.9	13100.00
2	2979.64	45.89	1.383	0.30 (0.25)	0.82	2910.0	13000.00
3	2902.18	47.99	1.346	0.30 (0.24)	0.82	2929.8	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 2979.64 Tc (MIN.) = 45.89  
 AREA-AVERAGED Fm (INCH/HR) = 0.25 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.82 EFFECTIVE AREA (ACRES) = 2909.99

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13109.00 TO NODE 13110.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 541.61 DOWNSTREAM (FEET) = 509.94  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2016.96 CHANNEL SLOPE = 0.0157  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.81

\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.338

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	283.06	0.30	0.791	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.791

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 3119.88

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 13.35

AVERAGE FLOW DEPTH (FEET) = 3.80 TRAVEL TIME (MIN.) = 2.52

Tc (MIN.) = 48.41

SUBAREA AREA (ACRES) = 283.06 SUBAREA RUNOFF (CFS) = 280.48

EFFECTIVE AREA (ACRES) = 3193.05 AREA-AVERAGED Fm (INCH/HR) = 0.24

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.81

TOTAL AREA (ACRES) = 3212.9 PEAK FLOW RATE (CFS) = 3143.42

GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.82

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 3.82 FLOW VELOCITY (FEET/SEC.) = 13.39

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13110.00 = 25660.75 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3007.91	24.69	1.956	0.30 (0.25)	0.82	1954.9	13100.00
2	3143.42	48.41	1.338	0.30 (0.24)	0.81	3193.0	13000.00
3	3057.10	50.53	1.302	0.30 (0.24)	0.81	3212.9	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 3143.42 Tc (MIN.) = 48.41

AREA-AVERAGED Fm (INCH/HR) = 0.24 AREA-AVERAGED Fp (INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.81 EFFECTIVE AREA (ACRES) = 3193.05

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FLOW PROCESS FROM NODE 13110.00 TO NODE 13111.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 509.94 DOWNSTREAM (FEET) = 461.07

CHANNEL LENGTH THRU SUBAREA (FEET) = 3058.95 CHANNEL SLOPE = 0.0160

GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.89

\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.276

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	248.05	0.30	0.783	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.783

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 3259.60

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 13.63

AVERAGE FLOW DEPTH (FEET) = 3.88 TRAVEL TIME (MIN.) = 3.74

Tc (MIN.) = 52.15

SUBAREA AREA (ACRES) = 248.05 SUBAREA RUNOFF (CFS) = 232.35

EFFECTIVE AREA (ACRES) = 3441.10 AREA-AVERAGED Fm (INCH/HR) = 0.24

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.81

TOTAL AREA (ACRES) = 3460.9 PEAK FLOW RATE (CFS) = 3195.97

GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.84

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 3.84 FLOW VELOCITY (FEET/SEC.) = 13.53

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13111.00 = 28719.70 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3085.80	28.46	1.802	0.30 (0.25)	0.82	2203.0	13100.00
2	3195.97	52.15	1.276	0.30 (0.24)	0.81	3441.1	13000.00
3	3107.04	54.31	1.241	0.30 (0.24)	0.81	3460.9	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 3195.97 Tc(MIN.) = 52.15  
AREA-AVERAGED Fm(INCH/HR) = 0.24 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.81 EFFECTIVE AREA(ACRES) = 3441.10

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FLOW PROCESS FROM NODE 13111.00 TO NODE 13112.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 461.07 DOWNSTREAM(FEET) = 452.77  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1781.78 CHANNEL SLOPE = 0.0047  
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.50  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.223

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	179.91	0.30	0.694	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.694  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3278.10  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.96  
AVERAGE FLOW DEPTH(FEET) = 5.50 TRAVEL TIME(MIN.) = 3.32  
Tc(MIN.) = 55.46

SUBAREA AREA(ACRES) = 179.91 SUBAREA RUNOFF(CFS) = 164.26  
EFFECTIVE AREA(ACRES) = 3621.01 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.81  
TOTAL AREA(ACRES) = 3640.9 PEAK FLOW RATE(CFS) = 3195.97  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.42

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 5.42 FLOW VELOCITY(FEET/SEC.) = 8.90  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13112.00 = 30501.48 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3114.18	31.80	1.694	0.30( 0.24)	0.81	2382.9	13100.00
2	3195.97	55.46	1.223	0.30( 0.24)	0.81	3621.0	13000.00
3	3107.04	57.65	1.188	0.30( 0.24)	0.81	3640.9	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 3195.97 Tc(MIN.) = 55.46  
AREA-AVERAGED Fm(INCH/HR) = 0.24 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.81 EFFECTIVE AREA(ACRES) = 3621.01

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FLOW PROCESS FROM NODE 13112.00 TO NODE 13222.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 452.77 DOWNSTREAM(FEET) = 427.51  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1625.01 CHANNEL SLOPE = 0.0155

GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.92  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.191

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	155.96	0.30	0.836	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.836  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3261.92  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.51  
AVERAGE FLOW DEPTH(FEET) = 3.91 TRAVEL TIME(MIN.) = 2.00  
Tc(MIN.) = 57.47  
SUBAREA AREA(ACRES) = 155.96 SUBAREA RUNOFF(CFS) = 131.91  
EFFECTIVE AREA(ACRES) = 3776.97 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.81  
TOTAL AREA(ACRES) = 3796.8 PEAK FLOW RATE(CFS) = 3223.29  
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.89

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.89 FLOW VELOCITY(FEET/SEC.) = 13.45  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13222.00 = 32126.49 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3200.30	33.81	1.643	0.30( 0.24)	0.81	2538.8	13100.00
2	3223.29	57.47	1.191	0.30( 0.24)	0.81	3777.0	13000.00
3	3119.89	59.67	1.155	0.30( 0.24)	0.81	3796.8	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 3223.29 Tc(MIN.) = 57.47  
AREA-AVERAGED Fm(INCH/HR) = 0.24 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.81 EFFECTIVE AREA(ACRES) = 3776.97

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 3796.8 TC(MIN.) = 57.47  
EFFECTIVE AREA(ACRES) = 3776.97 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.808  
PEAK FLOW RATE(CFS) = 3223.29

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3200.30	33.81	1.643	0.30( 0.24)	0.81	2538.8	13100.00
2	3223.29	57.47	1.191	0.30( 0.24)	0.81	3777.0	13000.00
3	3119.89	59.67	1.155	0.30( 0.24)	0.81	3796.8	13010.00

END OF RATIONAL METHOD ANALYSIS

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

Analysis prepared by:

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FILE NAME: S32.DAT  
TIME/DATE OF STUDY: 11:54 04/03/2013  
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--\*TIME-OF-CONCENTRATION MODEL\*--  
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USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 4.800
- 2) 10.00; 3.258
- 3) 15.00; 2.590
- 4) 20.00; 2.201
- 5) 25.00; 1.940
- 6) 30.00; 1.740
- 7) 40.00; 1.487
- 8) 50.00; 1.310
- 9) 60.00; 1.150
- 10) 90.00; 0.940
- 11) 120.00; 0.798
- 12) 180.00; 0.647
- 13) 360.00; 0.452
- 14) 1440.00; 0.187

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

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FLOW PROCESS FROM NODE 13200.00 TO NODE 13201.00 IS CODE = 21  
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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
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INITIAL SUBAREA FLOW-LENGTH(FEET) = 298.57  
ELEVATION DATA: UPSTREAM(FEET) = 1069.04 DOWNSTREAM(FEET) = 1005.76

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.410  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.440  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "OPEN BRUSH"	-	0.67	0.30	1.000	0	9.41

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 1.89  
TOTAL AREA(ACRES) = 0.67 PEAK FLOW RATE(CFS) = 1.89

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FLOW PROCESS FROM NODE 13201.00 TO NODE 13202.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
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ELEVATION DATA: UPSTREAM(FEET) = 1005.76 DOWNSTREAM(FEET) = 896.98  
CHANNEL LENGTH THRU SUBAREA(FEET) = 747.55 CHANNEL SLOPE = 0.1455  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.29  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.891  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	7.41	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.63  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.74  
AVERAGE FLOW DEPTH(FEET) = 0.27 TRAVEL TIME(MIN.) = 3.33  
Tc(MIN.) = 12.74  
SUBAREA AREA(ACRES) = 7.41 SUBAREA RUNOFF(CFS) = 17.28  
EFFECTIVE AREA(ACRES) = 8.08 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 8.1 PEAK FLOW RATE(CFS) = 18.84  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.38

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.38 FLOW VELOCITY(FEET/SEC.) = 4.65  
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13202.00 = 1046.12 FEET.

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FLOW PROCESS FROM NODE 13202.00 TO NODE 13203.00 IS CODE = 31

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>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 896.98 DOWNSTREAM(FEET) = 840.27
FLOW LENGTH(FEET) = 1789.59 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
DEPTH OF FLOW IN 36.0 INCH PIPE IS 10.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 11.82
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 18.84
PIPE TRAVEL TIME(MIN.) = 2.52 Tc(MIN.) = 15.27
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13203.00 = 2835.71 FEET.

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FLOW PROCESS FROM NODE 13202.00 TO NODE 13203.00 IS CODE = 81
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>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
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MAINLINE Tc(MIN.) = 15.27
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.569
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
  LAND USE          GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -      38.89    0.30    0.731   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.731
SUBAREA AREA(ACRES) = 38.89 SUBAREA RUNOFF(CFS) = 82.25
EFFECTIVE AREA(ACRES) = 46.97 AREA-AVERAGED Fm(INCH/HR) = 0.23
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.78
TOTAL AREA(ACRES) = 47.0 PEAK FLOW RATE(CFS) = 98.76

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FLOW PROCESS FROM NODE 13203.00 TO NODE 13204.00 IS CODE = 31
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>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 840.27 DOWNSTREAM(FEET) = 782.97
FLOW LENGTH(FEET) = 992.54 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
DEPTH OF FLOW IN 36.0 INCH PIPE IS 21.1 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 22.89
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 98.76
PIPE TRAVEL TIME(MIN.) = 0.72 Tc(MIN.) = 15.99
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13204.00 = 3828.25 FEET.

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FLOW PROCESS FROM NODE 13203.00 TO NODE 13204.00 IS CODE = 81
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>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
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MAINLINE Tc(MIN.) = 15.99
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.513
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
  LAND USE          GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -      38.89    0.30    0.731   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.731
SUBAREA AREA(ACRES) = 38.89 SUBAREA RUNOFF(CFS) = 82.25
EFFECTIVE AREA(ACRES) = 46.97 AREA-AVERAGED Fm(INCH/HR) = 0.23
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.78
TOTAL AREA(ACRES) = 47.0 PEAK FLOW RATE(CFS) = 98.76

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USER-DEFINED        -      83.09    0.30    0.645   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.645
SUBAREA AREA(ACRES) = 83.09 SUBAREA RUNOFF(CFS) = 173.46
EFFECTIVE AREA(ACRES) = 130.06 AREA-AVERAGED Fm(INCH/HR) = 0.21
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.69
TOTAL AREA(ACRES) = 130.1 PEAK FLOW RATE(CFS) = 269.84

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FLOW PROCESS FROM NODE 13204.00 TO NODE 13205.00 IS CODE = 31
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>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 782.97 DOWNSTREAM(FEET) = 692.52
FLOW LENGTH(FEET) = 2046.57 MANNING'S N = 0.013
DEPTH OF FLOW IN 48.0 INCH PIPE IS 37.1 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 25.93
ESTIMATED PIPE DIAMETER(INCH) = 48.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 269.84
PIPE TRAVEL TIME(MIN.) = 1.32 Tc(MIN.) = 17.30
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13205.00 = 5874.82 FEET.

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FLOW PROCESS FROM NODE 13204.00 TO NODE 13205.00 IS CODE = 81
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>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
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MAINLINE Tc(MIN.) = 17.30
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.411
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
  LAND USE          GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -      88.51    0.30    0.679   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.679
SUBAREA AREA(ACRES) = 88.51 SUBAREA RUNOFF(CFS) = 175.81
EFFECTIVE AREA(ACRES) = 218.57 AREA-AVERAGED Fm(INCH/HR) = 0.21
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.69
TOTAL AREA(ACRES) = 218.6 PEAK FLOW RATE(CFS) = 433.67

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FLOW PROCESS FROM NODE 13205.00 TO NODE 13206.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 692.52 DOWNSTREAM(FEET) = 605.24
CHANNEL LENGTH THRU SUBAREA(FEET) = 2704.69 CHANNEL SLOPE = 0.0323
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.23
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.129
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
  LAND USE          GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -      163.73    0.30    0.858   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30

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SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.858  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 571.76  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.08  
 AVERAGE FLOW DEPTH(FEET) = 3.16 TRAVEL TIME(MIN.) = 4.07  
 Tc(MIN.) = 21.37  
 SUBAREA AREA(ACRES) = 163.73 SUBAREA RUNOFF(CFS) = 275.85  
 EFFECTIVE AREA(ACRES) = 382.30 AREA-AVERAGED Fm(INCH/HR) = 0.23  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.76  
 TOTAL AREA(ACRES) = 382.3 PEAK FLOW RATE(CFS) = 654.17  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.39

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.39 FLOW VELOCITY(FEET/SEC.) = 11.50  
 LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13206.00 = 8579.51 FEET.

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 FLOW PROCESS FROM NODE 13206.00 TO NODE 13207.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 605.24 DOWNSTREAM(FEET) = 555.41  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2479.15 CHANNEL SLOPE = 0.0201  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.18  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.921

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	143.41	0.30	0.888	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.888  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 761.02  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.08  
 AVERAGE FLOW DEPTH(FEET) = 4.13 TRAVEL TIME(MIN.) = 4.10  
 Tc(MIN.) = 25.47  
 SUBAREA AREA(ACRES) = 143.41 SUBAREA RUNOFF(CFS) = 213.59  
 EFFECTIVE AREA(ACRES) = 525.71 AREA-AVERAGED Fm(INCH/HR) = 0.24  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.80  
 TOTAL AREA(ACRES) = 525.7 PEAK FLOW RATE(CFS) = 796.13  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.22 FLOW VELOCITY(FEET/SEC.) = 10.22  
 LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13207.00 = 11058.66 FEET.

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 FLOW PROCESS FROM NODE 13207.00 TO NODE 13220.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 555.41 DOWNSTREAM(FEET) = 505.65

CHANNEL LENGTH THRU SUBAREA(FEET) = 1734.55 CHANNEL SLOPE = 0.0287  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.09  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.824

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	123.56	0.30	0.858	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.858  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 883.28  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.96  
 AVERAGE FLOW DEPTH(FEET) = 4.07 TRAVEL TIME(MIN.) = 2.42  
 Tc(MIN.) = 27.89  
 SUBAREA AREA(ACRES) = 123.56 SUBAREA RUNOFF(CFS) = 174.27  
 EFFECTIVE AREA(ACRES) = 649.27 AREA-AVERAGED Fm(INCH/HR) = 0.24  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.81  
 TOTAL AREA(ACRES) = 649.3 PEAK FLOW RATE(CFS) = 924.65  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.17

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.17 FLOW VELOCITY(FEET/SEC.) = 12.10  
 LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13220.00 = 12793.21 FEET.

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 FLOW PROCESS FROM NODE 13207.00 TO NODE 13220.00 IS CODE = 1  
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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

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TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 27.89  
 RAINFALL INTENSITY(INCH/HR) = 1.82  
 AREA-AVERAGED Fm(INCH/HR) = 0.24  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.81  
 EFFECTIVE STREAM AREA(ACRES) = 649.27  
 TOTAL STREAM AREA(ACRES) = 649.27  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 924.65

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 FLOW PROCESS FROM NODE 13210.00 TO NODE 13211.00 IS CODE = 21  
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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

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INITIAL SUBAREA FLOW-LENGTH(FEET) = 314.51  
 ELEVATION DATA: UPSTREAM(FEET) = 949.80 DOWNSTREAM(FEET) = 828.64

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.525  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.713  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
USER-DEFINED	-	123.56	0.30	0.858	-	-

NATURAL FAIR COVER  
"OPEN BRUSH" - 1.96 0.30 1.000 0 8.53  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 6.02  
TOTAL AREA (ACRES) = 1.96 PEAK FLOW RATE (CFS) = 6.02

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FLOW PROCESS FROM NODE 13211.00 TO NODE 13212.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 828.64 DOWNSTREAM(FEET) = 767.94  
CHANNEL LENGTH THRU SUBAREA(FEET) = 652.49 CHANNEL SLOPE = 0.0930  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.50  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.111  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	11.95	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 21.22  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.22  
AVERAGE FLOW DEPTH(FEET) = 0.46 TRAVEL TIME(MIN.) = 2.58  
Tc(MIN.) = 11.10  
SUBAREA AREA(ACRES) = 11.95 SUBAREA RUNOFF(CFS) = 30.23  
EFFECTIVE AREA(ACRES) = 13.91 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 13.9 PEAK FLOW RATE(CFS) = 35.19  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.62

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.62 FLOW VELOCITY(FEET/SEC.) = 5.04  
LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13212.00 = 967.00 FEET.

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FLOW PROCESS FROM NODE 13212.00 TO NODE 13213.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 767.94 DOWNSTREAM(FEET) = 706.43  
CHANNEL LENGTH THRU SUBAREA(FEET) = 967.91 CHANNEL SLOPE = 0.0635  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.03  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.717  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	27.07	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 64.74  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.48  
AVERAGE FLOW DEPTH(FEET) = 0.99 TRAVEL TIME(MIN.) = 2.94  
Tc(MIN.) = 14.05  
SUBAREA AREA(ACRES) = 27.07 SUBAREA RUNOFF(CFS) = 58.89  
EFFECTIVE AREA(ACRES) = 40.98 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 41.0 PEAK FLOW RATE(CFS) = 89.15  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.19

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.19 FLOW VELOCITY(FEET/SEC.) = 6.07  
LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13213.00 = 1934.91 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13213.00 TO NODE 13214.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 706.43 DOWNSTREAM(FEET) = 659.31  
CHANNEL LENGTH THRU SUBAREA(FEET) = 948.11 CHANNEL SLOPE = 0.0497  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.42  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.456  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.09	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 106.71  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.91  
AVERAGE FLOW DEPTH(FEET) = 1.41 TRAVEL TIME(MIN.) = 2.67  
Tc(MIN.) = 16.72  
SUBAREA AREA(ACRES) = 18.09 SUBAREA RUNOFF(CFS) = 35.10  
EFFECTIVE AREA(ACRES) = 59.07 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 59.1 PEAK FLOW RATE(CFS) = 114.63  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.47

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.47 FLOW VELOCITY(FEET/SEC.) = 6.04  
LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13214.00 = 2883.02 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13214.00 TO NODE 13215.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 659.31 DOWNSTREAM(FEET) = 628.91

CHANNEL LENGTH THRU SUBAREA (FEET) = 970.24 CHANNEL SLOPE = 0.0313  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.16  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.242  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	71.42	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 177.11  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.87  
 AVERAGE FLOW DEPTH (FEET) = 2.12 TRAVEL TIME (MIN.) = 2.75  
 Tc (MIN.) = 19.47  
 SUBAREA AREA (ACRES) = 71.42 SUBAREA RUNOFF (CFS) = 124.82  
 EFFECTIVE AREA (ACRES) = 130.49 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 130.5 PEAK FLOW RATE (CFS) = 228.06  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.43

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.43 FLOW VELOCITY (FEET/SEC.) = 6.32  
 LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13215.00 = 3853.26 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13215.00 TO NODE 13216.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 628.91 DOWNSTREAM (FEET) = 598.39  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 922.63 CHANNEL SLOPE = 0.0331  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.57  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.108  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	36.33	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 257.63  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.68  
 AVERAGE FLOW DEPTH (FEET) = 2.55 TRAVEL TIME (MIN.) = 2.30  
 Tc (MIN.) = 21.78  
 SUBAREA AREA (ACRES) = 36.33 SUBAREA RUNOFF (CFS) = 59.13  
 EFFECTIVE AREA (ACRES) = 166.82 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 166.8 PEAK FLOW RATE (CFS) = 271.50  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.63

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 2.63 FLOW VELOCITY (FEET/SEC.) = 6.77  
 LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13216.00 = 4775.89 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13216.00 TO NODE 13217.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 598.39 DOWNSTREAM (FEET) = 568.48  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 636.40 CHANNEL SLOPE = 0.0470  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.55  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.038  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	42.51	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 304.76  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.93  
 AVERAGE FLOW DEPTH (FEET) = 2.55 TRAVEL TIME (MIN.) = 1.34  
 Tc (MIN.) = 23.11  
 SUBAREA AREA (ACRES) = 42.51 SUBAREA RUNOFF (CFS) = 66.51  
 EFFECTIVE AREA (ACRES) = 209.33 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 209.3 PEAK FLOW RATE (CFS) = 327.54  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 2.64

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.64 FLOW VELOCITY (FEET/SEC.) = 8.10  
 LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13217.00 = 5412.29 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13217.00 TO NODE 13220.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 568.48 DOWNSTREAM (FEET) = 505.65  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1896.50 CHANNEL SLOPE = 0.0331  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 3.16  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.846  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	73.24	0.30	0.951	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.951  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 378.99  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.44  
 AVERAGE FLOW DEPTH (FEET) = 3.13 TRAVEL TIME (MIN.) = 4.25

Tc(MIN.) = 27.36  
 SUBAREA AREA(ACRES) = 73.24 SUBAREA RUNOFF(CFS) = 102.85  
 EFFECTIVE AREA(ACRES) = 282.57 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 282.6 PEAK FLOW RATE(CFS) = 394.05  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.19

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.19 FLOW VELOCITY(FEET/SEC.) = 7.53  
 LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13220.00 = 7308.79 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13217.00 TO NODE 13220.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 27.36  
 RAINFALL INTENSITY(INCH/HR) = 1.85  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.99  
 EFFECTIVE STREAM AREA(ACRES) = 282.57  
 TOTAL STREAM AREA(ACRES) = 282.57  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 394.05

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	924.65	27.89	1.824	0.30( 0.24)	0.81	649.3	13200.00
2	394.05	27.36	1.846	0.30( 0.30)	0.99	282.6	13210.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1313.30	27.36	1.846	0.30( 0.26)	0.86	919.5	13210.00
2	1313.33	27.89	1.824	0.30( 0.26)	0.86	931.8	13200.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 1313.33 Tc(MIN.) = 27.89  
 EFFECTIVE AREA(ACRES) = 931.84 AREA-AVERAGED Fm(INCH/HR) = 0.26  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.86  
 TOTAL AREA(ACRES) = 931.8  
 LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13220.00 = 12793.21 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13220.00 TO NODE 13221.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 505.65 DOWNSTREAM(FEET) = 478.94  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1949.14 CHANNEL SLOPE = 0.0137  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.31  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.729

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	108.50	0.30	0.637	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.637  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1388.40  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.70  
 AVERAGE FLOW DEPTH(FEET) = 5.31 TRAVEL TIME(MIN.) = 2.56  
 Tc(MIN.) = 30.45

SUBAREA AREA(ACRES) = 108.50 SUBAREA RUNOFF(CFS) = 150.15  
 EFFECTIVE AREA(ACRES) = 1040.34 AREA-AVERAGED Fm(INCH/HR) = 0.25  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.84  
 TOTAL AREA(ACRES) = 1040.3 PEAK FLOW RATE(CFS) = 1383.16  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.29

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 5.29 FLOW VELOCITY(FEET/SEC.) = 12.70  
 LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13221.00 = 14742.35 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1380.23	29.92	1.743	0.30( 0.25)	0.84	1028.0	13210.00
2	1383.16	30.45	1.729	0.30( 0.25)	0.84	1040.3	13200.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 1383.16 Tc(MIN.) = 30.45  
 AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.84 EFFECTIVE AREA(ACRES) = 1040.34

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13221.00 TO NODE 13222.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 478.94 DOWNSTREAM(FEET) = 427.51  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2078.70 CHANNEL SLOPE = 0.0247  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.67  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.674  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	87.26	0.30	0.699	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.699  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1440.65  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.94



AVERAGE FLOW DEPTH (FEET) = 4.67 TRAVEL TIME (MIN.) = 2.17  
 Tc (MIN.) = 32.62  
 SUBAREA AREA (ACRES) = 87.26 SUBAREA RUNOFF (CFS) = 114.98  
 EFFECTIVE AREA (ACRES) = 1127.60 AREA-AVERAGED Fm (INCH/HR) = 0.25  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83  
 TOTAL AREA (ACRES) = 1127.6 PEAK FLOW RATE (CFS) = 1446.65  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 4.68

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 4.68 FLOW VELOCITY (FEET/SEC.) = 15.96  
 LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13222.00 = 16821.05 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1444.26	32.09	1.687	0.30 (0.25)	0.83	1115.3	13210.00
2	1446.65	32.62	1.674	0.30 (0.25)	0.83	1127.6	13200.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 1446.65 Tc (MIN.) = 32.62  
 AREA-AVERAGED Fm (INCH/HR) = 0.25 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.83 EFFECTIVE AREA (ACRES) = 1127.60

=====  
 END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 1127.6 TC (MIN.) = 32.62  
 EFFECTIVE AREA (ACRES) = 1127.60 AREA-AVERAGED Fm (INCH/HR) = 0.25  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.828  
 PEAK FLOW RATE (CFS) = 1446.65

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1444.26	32.09	1.687	0.30 (0.25)	0.83	1115.3	13210.00
2	1446.65	32.62	1.674	0.30 (0.25)	0.83	1127.6	13200.00

=====  
 END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*

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

Michael Baker International  
5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

-----  
FILE NAME: S33.DAT  
TIME/DATE OF STUDY: 08:14 07/16/2018  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.872
- 2) 10.00; 3.787
- 3) 15.00; 2.932
- 4) 20.00; 2.418
- 5) 25.00; 2.095
- 6) 30.00; 1.872
- 7) 40.00; 1.616
- 8) 50.00; 1.400
- 9) 60.00; 1.290
- 10) 90.00; 1.087
- 11) 120.00; 0.950
- 12) 180.00; 0.794
- 13) 360.00; 0.588
- 14) 1200.00; 0.256

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313 0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 13112.00 TO NODE 13222.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: S31.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap (INCH/HR)	Ae (ACRES)	HEADWATER NODE
1	3200.30	33.81	0.30 ( 0.24)	0.81	2538.8	13100.00
2	3223.29	57.47	0.30 ( 0.24)	0.81	3777.0	13000.00
3	3119.89	59.67	0.30 ( 0.24)	0.81	3796.8	13010.00
TOTAL AREA (ACRES) =						3796.8

\*\*\*\*\*

FLOW PROCESS FROM NODE 13221.00 TO NODE 13222.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: S32.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap (INCH/HR)	Ae (ACRES)	HEADWATER NODE
1	1444.26	32.09	0.30 ( 0.25)	0.83	1115.3	13210.00
2	1446.65	32.62	0.30 ( 0.25)	0.83	1127.6	13200.00
TOTAL AREA (ACRES) =						1127.6

\*\*\*\*\*

FLOW PROCESS FROM NODE 13221.00 TO NODE 13222.00 IS CODE = 14.0  
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>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap (INCH/HR)	Ae (ACRES)	HEADWATER NODE
1	1444.26	32.09	0.30 ( 0.25)	0.83	1115.3	13210.00
2	1446.65	32.62	0.30 ( 0.25)	0.83	1127.6	13200.00
TOTAL AREA (ACRES) =						1127.6

\*\*\*\*\*

FLOW PROCESS FROM NODE 13112.00 TO NODE 13222.00 IS CODE = 11  
-----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<<  
=====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap (INCH/HR)	Ae (ACRES)	HEADWATER NODE
1	1444.26	32.09	1.819	0.30 ( 0.25)	0.83	1115.3	13210.00
2	1446.65	32.62	1.805	0.30 ( 0.25)	0.83	1127.6	13200.00
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13222.00 =							16821.05 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap (INCH/HR)	Ae (ACRES)	HEADWATER NODE
1	3200.30	33.81	1.774	0.30 ( 0.24)	0.81	2538.8	13100.00
2	3223.29	57.47	1.318	0.30 ( 0.24)	0.81	3777.0	13000.00

3 3119.89 59.67 1.293 0.30( 0.24) 0.81 3796.8 13010.00  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13222.00 = 32126.49 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4568.86	32.09	1.819	0.30( 0.24)	0.82	3524.7	13210.00
2	4595.53	32.62	1.805	0.30( 0.24)	0.82	3576.8	13200.00
3	4618.56	33.81	1.774	0.30( 0.24)	0.82	3666.4	13100.00
4	4217.03	57.47	1.318	0.30( 0.24)	0.81	4904.6	13000.00
5	4091.14	59.67	1.293	0.30( 0.24)	0.81	4924.4	13010.00
TOTAL AREA (ACRES) =							4924.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 4618.56 Tc (MIN.) = 33.814  
EFFECTIVE AREA (ACRES) = 3666.44 AREA-AVERAGED Fm (INCH/HR) = 0.24  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.82  
TOTAL AREA (ACRES) = 4924.4  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13222.00 = 32126.49 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13222.00 TO NODE 13223.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 427.51 DOWNSTREAM (FEET) = 416.40  
CHANNEL LENGTH THRU SUBAREA (FEET) = 864.00 CHANNEL SLOPE = 0.0129  
GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.89  
CHANNEL FLOW THRU SUBAREA (CFS) = 4618.56  
FLOW VELOCITY (FEET/SEC.) = 11.60 FLOW DEPTH (FEET) = 5.89  
TRAVEL TIME (MIN.) = 1.24 Tc (MIN.) = 35.06  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13223.00 = 32990.49 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4891.80	33.34	1.787	0.30( 0.24)	0.82	3524.7	13210.00
2	4920.81	33.86	1.773	0.30( 0.24)	0.82	3576.8	13200.00
3	4943.60	35.06	1.743	0.30( 0.24)	0.82	3666.4	13100.00
4	4678.80	58.74	1.304	0.30( 0.24)	0.81	4904.6	13000.00
5	4608.15	60.96	1.283	0.30( 0.24)	0.81	4924.4	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 4943.60 Tc (MIN.) = 35.06  
AREA-AVERAGED Fm (INCH/HR) = 0.24 AREA-AVERAGED Fp (INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.82 EFFECTIVE AREA (ACRES) = 3666.44

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13223.00 TO NODE 13223.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13223.00 TO NODE 13223.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610301Y.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	82.11	12.18	0.30( 0.30)	1.00	29.3	30100.00
2	71.26	14.79	0.30( 0.30)	1.00	29.7	30110.00
TOTAL AREA (ACRES) =						29.7

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13223.00 TO NODE 13223.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4891.80	33.34	1.787	0.30( 0.24)	0.82	3524.7	13210.00
2	4920.81	33.86	1.773	0.30( 0.24)	0.82	3576.8	13200.00
3	4943.60	35.06	1.743	0.30( 0.24)	0.82	3666.4	13100.00
4	4678.80	58.74	1.304	0.30( 0.24)	0.81	4904.6	13000.00
5	4608.15	60.96	1.283	0.30( 0.24)	0.81	4924.4	13010.00
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13223.00 =							32990.49 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	82.11	12.18	3.415	0.30( 0.30)	1.00	29.3	30100.00
2	71.26	14.79	2.968	0.30( 0.30)	1.00	29.7	30110.00
LONGEST FLOWPATH FROM NODE 30110.00 TO NODE 13223.00 =							2058.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3755.35	12.18	3.415	0.30( 0.25)	0.82	1316.6	30100.00
2	3903.82	14.79	2.968	0.30( 0.25)	0.82	1593.2	30110.00
3	4931.51	33.34	1.787	0.30( 0.25)	0.82	3554.3	13210.00
4	4960.15	33.86	1.773	0.30( 0.25)	0.82	3606.5	13200.00
5	4982.13	35.06	1.743	0.30( 0.24)	0.82	3696.1	13100.00
6	4705.60	58.74	1.304	0.30( 0.24)	0.81	4934.2	13000.00
7	4634.41	60.96	1.283	0.30( 0.24)	0.81	4954.1	13010.00
TOTAL AREA (ACRES) =							4954.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 4982.13 Tc (MIN.) = 35.056  
EFFECTIVE AREA (ACRES) = 3696.11 AREA-AVERAGED Fm (INCH/HR) = 0.24  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.82  
TOTAL AREA (ACRES) = 4954.1  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13223.00 = 32990.49 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13223.00 TO NODE 13224.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 416.40 DOWNSTREAM(FEET) = 410.60  
CHANNEL LENGTH THRU SUBAREA(FEET) = 408.51 CHANNEL SLOPE = 0.0142  
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.97  
CHANNEL FLOW THRU SUBAREA(CFS) = 4982.13  
FLOW VELOCITY(FEET/SEC.) = 12.29 FLOW DEPTH(FEET) = 5.97  
TRAVEL TIME(MIN.) = 0.55 Tc(MIN.) = 35.61  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13224.00 = 33399.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3755.35	12.78	3.312	0.30 ( 0.25)	0.82	1316.6	30100.00
2	3903.82	15.39	2.892	0.30 ( 0.25)	0.82	1593.2	30110.00
3	4931.51	33.89	1.772	0.30 ( 0.25)	0.82	3554.3	13210.00
4	4960.15	34.42	1.759	0.30 ( 0.25)	0.82	3606.5	13200.00
5	4982.13	35.61	1.729	0.30 ( 0.24)	0.82	3696.1	13100.00
6	4705.60	59.31	1.297	0.30 ( 0.24)	0.81	4934.2	13000.00
7	4634.41	61.53	1.280	0.30 ( 0.24)	0.81	4954.1	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 4982.13 Tc(MIN.) = 35.61  
AREA-AVERAGED Fm(INCH/HR) = 0.24 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.82 EFFECTIVE AREA(ACRES) = 3696.11

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13224.00 TO NODE 13224.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13224.00 TO NODE 13224.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610302Y.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	36.78	10.32	0.30 ( 0.30)	1.00	11.9	30210.00
2	36.55	10.65	0.30 ( 0.30)	1.00	12.0	30200.00

TOTAL AREA(ACRES) = 12.0

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13224.00 TO NODE 13224.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3755.35	12.78	3.312	0.30 ( 0.25)	0.82	1316.6	30100.00
2	3903.82	15.39	2.892	0.30 ( 0.25)	0.82	1593.2	30110.00
3	4931.51	33.89	1.772	0.30 ( 0.25)	0.82	3554.3	13210.00
4	4960.15	34.42	1.759	0.30 ( 0.25)	0.82	3606.5	13200.00
5	4982.13	35.61	1.729	0.30 ( 0.24)	0.82	3696.1	13100.00

6	4705.60	59.31	1.297	0.30 ( 0.24)	0.81	4934.2	13000.00
7	4634.41	61.53	1.280	0.30 ( 0.24)	0.81	4954.1	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13224.00 = 33399.00 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	36.78	10.32	3.732	0.30 ( 0.30)	1.00	11.9	30210.00
2	36.55	10.65	3.676	0.30 ( 0.30)	1.00	12.0	30200.00

LONGEST FLOWPATH FROM NODE 30200.00 TO NODE 13224.00 = 1209.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3486.29	10.32	3.732	0.30 ( 0.25)	0.82	1075.5	30210.00
2	3537.81	10.65	3.676	0.30 ( 0.25)	0.82	1109.1	30200.00
3	3787.96	12.78	3.312	0.30 ( 0.25)	0.82	1328.6	30100.00
4	3931.88	15.39	2.892	0.30 ( 0.25)	0.82	1605.2	30110.00
5	4947.44	33.89	1.772	0.30 ( 0.25)	0.82	3566.4	13210.00
6	4975.95	34.42	1.759	0.30 ( 0.25)	0.82	3618.5	13200.00
7	4997.59	35.61	1.729	0.30 ( 0.25)	0.82	3708.1	13100.00
8	4716.40	59.31	1.297	0.30 ( 0.24)	0.81	4946.3	13000.00
9	4645.02	61.53	1.280	0.30 ( 0.24)	0.81	4966.1	13010.00

TOTAL AREA(ACRES) = 4966.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 4997.59 Tc(MIN.) = 35.611  
EFFECTIVE AREA(ACRES) = 3708.14 AREA-AVERAGED Fm(INCH/HR) = 0.25  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.82  
TOTAL AREA(ACRES) = 4966.1  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13224.00 = 33399.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13224.00 TO NODE 13301.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 410.60 DOWNSTREAM(FEET) = 382.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1260.70 CHANNEL SLOPE = 0.0227  
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 5.28  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.691

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	61.66	0.30	0.998	-

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.998

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5036.22

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.50

AVERAGE FLOW DEPTH(FEET) = 5.28 TRAVEL TIME(MIN.) = 1.45

Tc(MIN.) = 37.06

SUBAREA AREA(ACRES) = 61.66 SUBAREA RUNOFF(CFS) = 77.25

EFFECTIVE AREA(ACRES) = 3769.80 AREA-AVERAGED Fm(INCH/HR) = 0.25

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.82

TOTAL AREA(ACRES) = 5027.8 PEAK FLOW RATE(CFS) = 4997.59

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 5.25

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 5.25 FLOW VELOCITY (FEET/SEC.) = 14.46  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13301.00 = 34659.70 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3486.29	11.94	3.455	0.30 (0.25)	0.83	1137.2	30210.00
2	3537.81	12.26	3.401	0.30 (0.25)	0.83	1170.7	30200.00
3	3787.96	14.36	3.042	0.30 (0.25)	0.83	1390.3	30100.00
4	3931.88	16.94	2.732	0.30 (0.25)	0.83	1666.9	30110.00
5	4947.44	35.35	1.735	0.30 (0.25)	0.82	3628.0	13210.00
6	4975.95	35.87	1.722	0.30 (0.25)	0.82	3680.1	13200.00
7	4997.59	37.06	1.691	0.30 (0.25)	0.82	3769.8	13100.00
8	4716.40	60.79	1.285	0.30 (0.24)	0.82	5007.9	13000.00
9	4645.02	63.01	1.269	0.30 (0.24)	0.82	5027.8	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 4997.59 Tc (MIN.) = 37.06  
 AREA-AVERAGED Fm (INCH/HR) = 0.25 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.82 EFFECTIVE AREA (ACRES) = 3769.80

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13301.00 TO NODE 13301.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610303Y.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	317.84	19.93	0.30 (0.30)	1.00	166.2	30300.00
TOTAL AREA (ACRES) = 166.2						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13301.00 TO NODE 13301.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3486.29	11.94	3.455	0.30 (0.25)	0.83	1137.2	30210.00
2	3537.81	12.26	3.401	0.30 (0.25)	0.83	1170.7	30200.00
3	3787.96	14.36	3.042	0.30 (0.25)	0.83	1390.3	30100.00
4	3931.88	16.94	2.732	0.30 (0.25)	0.83	1666.9	30110.00
5	4947.44	35.35	1.735	0.30 (0.25)	0.82	3628.0	13210.00
6	4975.95	35.87	1.722	0.30 (0.25)	0.82	3680.1	13200.00
7	4997.59	37.06	1.691	0.30 (0.25)	0.82	3769.8	13100.00
8	4716.40	60.79	1.285	0.30 (0.24)	0.82	5007.9	13000.00
9	4645.02	63.01	1.269	0.30 (0.24)	0.82	5027.8	13010.00
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13301.00 = 34659.70 FEET.							

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	317.84	19.93	2.425	0.30 (0.30)	1.00	166.2	30300.00
LONGEST FLOWPATH FROM NODE 30300.00 TO NODE 13301.00 = 6391.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3769.00	11.94	3.455	0.30 (0.25)	0.84	1236.8	30210.00
2	3823.03	12.26	3.401	0.30 (0.25)	0.84	1272.9	30200.00
3	4083.34	14.36	3.042	0.30 (0.25)	0.84	1510.0	30100.00
4	4241.11	16.94	2.732	0.30 (0.25)	0.84	1808.2	30110.00
5	4414.73	19.93	2.425	0.30 (0.25)	0.84	2151.8	30300.00
6	5162.14	35.35	1.735	0.30 (0.25)	0.83	3794.2	13210.00
7	5188.64	35.87	1.722	0.30 (0.25)	0.83	3846.4	13200.00
8	5205.73	37.06	1.691	0.30 (0.25)	0.83	3936.0	13100.00
9	4863.68	60.79	1.285	0.30 (0.25)	0.82	5174.1	13000.00
10	4790.04	63.01	1.269	0.30 (0.25)	0.82	5194.0	13010.00
TOTAL AREA (ACRES) = 5194.0							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 5205.73 Tc (MIN.) = 37.060  
 EFFECTIVE AREA (ACRES) = 3936.02 AREA-AVERAGED Fm (INCH/HR) = 0.25  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83  
 TOTAL AREA (ACRES) = 5194.0

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13301.00 = 34659.70 FEET.

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

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 382.00 DOWNSTREAM (FEET) = 375.00  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1141.09 CHANNEL SLOPE = 0.0061  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 7.69

\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.639

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	9.42	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 5211.41

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.28

AVERAGE FLOW DEPTH (FEET) = 7.69 TRAVEL TIME (MIN.) = 2.05

Tc (MIN.) = 39.11

SUBAREA AREA (ACRES) = 9.42 SUBAREA RUNOFF (CFS) = 11.35

EFFECTIVE AREA (ACRES) = 3945.44 AREA-AVERAGED Fm (INCH/HR) = 0.25

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.83

TOTAL AREA (ACRES) = 5203.4 PEAK FLOW RATE (CFS) = 5205.73

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT (FEET) = 7.68

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 7.68 FLOW VELOCITY(FEET/SEC.) = 9.28

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13302.00 = 35800.79 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3769.00	14.20	3.070	0.30( 0.25)	0.85	1246.2	30210.00
2	3823.03	14.50	3.017	0.30( 0.25)	0.85	1282.4	30200.00
3	4083.34	16.56	2.772	0.30( 0.25)	0.84	1519.4	30100.00
4	4241.11	19.12	2.508	0.30( 0.25)	0.84	1817.6	30110.00
5	4414.73	22.09	2.283	0.30( 0.25)	0.84	2161.2	30300.00
6	5162.14	37.40	1.683	0.30( 0.25)	0.83	3803.7	13210.00
7	5188.64	37.92	1.669	0.30( 0.25)	0.83	3855.8	13200.00
8	5205.73	39.11	1.639	0.30( 0.25)	0.83	3945.4	13100.00
9	4863.68	62.88	1.270	0.30( 0.25)	0.82	5183.6	13000.00
10	4790.04	65.11	1.255	0.30( 0.25)	0.82	5203.4	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 5205.73 Tc(MIN.) = 39.11

AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.83 EFFECTIVE AREA(ACRES) = 3945.44

\*\*\*\*\*

FLOW PROCESS FROM NODE 13301.00 TO NODE 13302.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

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FLOW PROCESS FROM NODE 13302.00 TO NODE 13302.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610214Y.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	390.02	23.32	0.30( 0.30)	1.00	227.7	21400.00
TOTAL AREA(ACRES) = 227.7						

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FLOW PROCESS FROM NODE 13302.00 TO NODE 13302.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3769.00	14.20	3.070	0.30( 0.25)	0.85	1246.2	30210.00
2	3823.03	14.50	3.017	0.30( 0.25)	0.85	1282.4	30200.00
3	4083.34	16.56	2.772	0.30( 0.25)	0.84	1519.4	30100.00
4	4241.11	19.12	2.508	0.30( 0.25)	0.84	1817.6	30110.00
5	4414.73	22.09	2.283	0.30( 0.25)	0.84	2161.2	30300.00
6	5162.14	37.40	1.683	0.30( 0.25)	0.83	3803.7	13210.00
7	5188.64	37.92	1.669	0.30( 0.25)	0.83	3855.8	13200.00
8	5205.73	39.11	1.639	0.30( 0.25)	0.83	3945.4	13100.00

9	4863.68	62.88	1.270	0.30( 0.25)	0.82	5183.6	13000.00
10	4790.04	65.11	1.255	0.30( 0.25)	0.82	5203.4	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13302.00 = 35800.79 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	390.02	23.32	2.204	0.30( 0.30)	1.00	227.7	21400.00
LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 13302.00 = 6708.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4114.36	14.20	3.070	0.30( 0.26)	0.86	1384.7	30210.00
2	4169.17	14.50	3.017	0.30( 0.26)	0.86	1423.9	30200.00
3	4442.87	16.56	2.772	0.30( 0.26)	0.86	1681.0	30100.00
4	4612.07	19.12	2.508	0.30( 0.26)	0.86	2004.2	30110.00
5	4799.56	22.09	2.283	0.30( 0.26)	0.85	2376.8	30300.00
6	4865.12	23.32	2.204	0.30( 0.26)	0.85	2521.5	21400.00
7	5445.45	37.40	1.683	0.30( 0.25)	0.84	4031.3	13210.00
8	5469.23	37.92	1.669	0.30( 0.25)	0.84	4083.4	13200.00
9	5480.10	39.11	1.639	0.30( 0.25)	0.84	4173.1	13100.00
10	5062.54	62.88	1.270	0.30( 0.25)	0.83	5411.2	13000.00
11	4985.81	65.11	1.255	0.30( 0.25)	0.83	5431.1	13010.00
TOTAL AREA(ACRES) = 5431.1							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 5480.10 Tc(MIN.) = 39.110

EFFECTIVE AREA(ACRES) = 4173.09 AREA-AVERAGED Fm(INCH/HR) = 0.25

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.84

TOTAL AREA(ACRES) = 5431.1

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13302.00 = 35800.79 FEET.

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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) = 7.10  
CHANNEL FLOW THRU SUBAREA(CFS) = 5480.10  
FLOW VELOCITY(FEET/SEC.) = 10.83 FLOW DEPTH(FEET) = 7.10  
TRAVEL TIME(MIN.) = 3.38 Tc(MIN.) = 42.49  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13303.00 = 37994.75 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4114.36	17.88	2.636	0.30( 0.26)	0.86	1384.7	30210.00
2	4169.17	18.17	2.606	0.30( 0.26)	0.86	1423.9	30200.00
3	4442.87	20.16	2.408	0.30( 0.26)	0.86	1681.0	30100.00
4	4612.07	22.68	2.245	0.30( 0.26)	0.86	2004.2	30110.00
5	4799.56	25.60	2.069	0.30( 0.26)	0.85	2376.8	30300.00
6	4865.12	26.82	2.014	0.30( 0.26)	0.85	2521.5	21400.00

7	5445.45	40.79	1.599	0.30 ( 0.25)	0.84	4031.3	13210.00
8	5469.23	41.30	1.588	0.30 ( 0.25)	0.84	4083.4	13200.00
9	5480.10	42.49	1.562	0.30 ( 0.25)	0.84	4173.1	13100.00
10	5062.54	66.34	1.247	0.30 ( 0.25)	0.83	5411.2	13000.00
11	4985.81	68.59	1.232	0.30 ( 0.25)	0.83	5431.1	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 5480.10 Tc(MIN.) = 42.49  
 AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.84 EFFECTIVE AREA(ACRES) = 4173.09

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FLOW PROCESS FROM NODE 13303.00 TO NODE 13303.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<<

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FLOW PROCESS FROM NODE 13303.00 TO NODE 13303.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610213Y.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	230.59	15.23	0.30 ( 0.30)	1.00	98.2	21300.00
TOTAL AREA(ACRES) = 98.2						

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FLOW PROCESS FROM NODE 13303.00 TO NODE 13303.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4114.36	17.88	2.636	0.30 ( 0.26)	0.86	1384.7	30210.00
2	4169.17	18.17	2.606	0.30 ( 0.26)	0.86	1423.9	30200.00
3	4442.87	20.16	2.408	0.30 ( 0.26)	0.86	1681.0	30100.00
4	4612.07	22.68	2.245	0.30 ( 0.26)	0.86	2004.2	30110.00
5	4799.56	25.60	2.069	0.30 ( 0.26)	0.85	2376.8	30300.00
6	4865.12	26.82	2.014	0.30 ( 0.26)	0.85	2521.5	21400.00
7	5445.45	40.79	1.599	0.30 ( 0.25)	0.84	4031.3	13210.00
8	5469.23	41.30	1.588	0.30 ( 0.25)	0.84	4083.4	13200.00
9	5480.10	42.49	1.562	0.30 ( 0.25)	0.84	4173.1	13100.00
10	5062.54	66.34	1.247	0.30 ( 0.25)	0.83	5411.2	13000.00
11	4985.81	68.59	1.232	0.30 ( 0.25)	0.83	5431.1	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13303.00 = 37994.75 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	230.59	15.23	2.909	0.30 ( 0.30)	1.00	98.2	21300.00

LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 13303.00 = 2988.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
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NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE	
1	4136.31	15.23	2.909	0.30 ( 0.26)	0.87	1277.7	21300.00
2	4320.88	17.88	2.636	0.30 ( 0.26)	0.87	1483.0	30210.00
3	4373.02	18.17	2.606	0.30 ( 0.26)	0.87	1522.1	30200.00
4	4629.21	20.16	2.408	0.30 ( 0.26)	0.87	1779.2	30100.00
5	4784.01	22.68	2.245	0.30 ( 0.26)	0.86	2102.5	30110.00
6	4955.88	25.60	2.069	0.30 ( 0.26)	0.86	2475.0	30300.00
7	5016.61	26.82	2.014	0.30 ( 0.26)	0.86	2619.7	21400.00
8	5560.28	40.79	1.599	0.30 ( 0.25)	0.84	4129.5	13210.00
9	5583.08	41.30	1.588	0.30 ( 0.25)	0.84	4181.7	13200.00
10	5591.68	42.49	1.562	0.30 ( 0.25)	0.84	4271.3	13100.00
11	5146.25	66.34	1.247	0.30 ( 0.25)	0.83	5509.4	13000.00
12	5068.18	68.59	1.232	0.30 ( 0.25)	0.83	5529.3	13010.00
TOTAL AREA(ACRES) = 5529.3							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 5591.68 Tc(MIN.) = 42.486  
 EFFECTIVE AREA(ACRES) = 4271.32 AREA-AVERAGED Fm(INCH/HR) = 0.25  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.84  
 TOTAL AREA(ACRES) = 5529.3

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13303.00 = 37994.75 FEET.

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FLOW PROCESS FROM NODE 13303.00 TO NODE 13304.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 355.00 DOWNSTREAM(FEET) = 350.00

CHANNEL LENGTH THRU SUBAREA(FEET) = 925.40 CHANNEL SLOPE = 0.0054

GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.27

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.525

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	13.84	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5599.31

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.06

AVERAGE FLOW DEPTH(FEET) = 8.27 TRAVEL TIME(MIN.) = 1.70

Tc(MIN.) = 44.19

SUBAREA AREA(ACRES) = 13.84 SUBAREA RUNOFF(CFS) = 15.26

EFFECTIVE AREA(ACRES) = 4285.16 AREA-AVERAGED Fm(INCH/HR) = 0.25

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.84

TOTAL AREA(ACRES) = 5543.1 PEAK FLOW RATE(CFS) = 5591.68

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT(FEET) = 8.26

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.26 FLOW VELOCITY(FEET/SEC.) = 9.06

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13304.00 = 38920.15 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4136.31	17.08	2.718	0.30( 0.26)	0.87	1291.5	21300.00
2	4320.88	19.71	2.448	0.30( 0.26)	0.87	1496.8	30210.00
3	4373.02	20.00	2.418	0.30( 0.26)	0.87	1536.0	30200.00
4	4629.21	21.95	2.292	0.30( 0.26)	0.87	1793.0	30100.00
5	4784.01	24.46	2.130	0.30( 0.26)	0.86	2116.3	30110.00
6	4955.88	27.36	1.990	0.30( 0.26)	0.86	2488.8	30300.00
7	5016.61	28.58	1.935	0.30( 0.26)	0.86	2633.6	21400.00
8	5560.28	42.49	1.562	0.30( 0.25)	0.84	4143.4	13210.00
9	5583.08	43.00	1.551	0.30( 0.25)	0.84	4195.5	13200.00
10	5591.68	44.19	1.525	0.30( 0.25)	0.84	4285.2	13100.00
11	5146.25	68.08	1.235	0.30( 0.25)	0.83	5523.3	13000.00
12	5068.18	70.34	1.220	0.30( 0.25)	0.83	5543.1	13010.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 5591.68 Tc(MIN.) = 44.19  
AREA-AVERAGED Fm(INCH/HR) = 0.25 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.84 EFFECTIVE AREA(ACRES) = 4285.16

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 3 <<<<<<  
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\*\*\*\*\*  
FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<<  
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PEAK FLOWRATE TABLE FILE NAME: 0610304Y.DNA  
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	345.08	17.98	0.30( 0.30)	1.00	164.9	30410.00
2	320.50	22.62	0.30( 0.30)	1.00	182.7	30400.00
TOTAL AREA(ACRES) = 182.7						

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FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 11  
-----  
>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4136.31	17.08	2.718	0.30( 0.26)	0.87	1291.5	21300.00
2	4320.88	19.71	2.448	0.30( 0.26)	0.87	1496.8	30210.00
3	4373.02	20.00	2.418	0.30( 0.26)	0.87	1536.0	30200.00
4	4629.21	21.95	2.292	0.30( 0.26)	0.87	1793.0	30100.00
5	4784.01	24.46	2.130	0.30( 0.26)	0.86	2116.3	30110.00
6	4955.88	27.36	1.990	0.30( 0.26)	0.86	2488.8	30300.00
7	5016.61	28.58	1.935	0.30( 0.26)	0.86	2633.6	21400.00
8	5560.28	42.49	1.562	0.30( 0.25)	0.84	4143.4	13210.00
9	5583.08	43.00	1.551	0.30( 0.25)	0.84	4195.5	13200.00
10	5591.68	44.19	1.525	0.30( 0.25)	0.84	4285.2	13100.00
11	5146.25	68.08	1.235	0.30( 0.25)	0.83	5523.3	13000.00

12 5068.18 70.34 1.220 0.30( 0.25) 0.83 5543.1 13010.00  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13304.00 = 38920.15 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	345.08	17.98	2.625	0.30( 0.30)	1.00	164.9	30410.00
2	320.50	22.62	2.249	0.30( 0.30)	1.00	182.7	30400.00
LONGEST FLOWPATH FROM NODE 30400.00 TO NODE 13304.00 = 5899.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4477.17	17.08	2.718	0.30( 0.27)	0.89	1448.2	21300.00
2	4544.44	17.98	2.625	0.30( 0.27)	0.89	1526.5	30410.00
3	4656.79	19.71	2.448	0.30( 0.27)	0.88	1668.3	30210.00
4	4707.41	20.00	2.418	0.30( 0.27)	0.88	1708.6	30200.00
5	4953.22	21.95	2.292	0.30( 0.26)	0.88	1973.2	30100.00
6	4990.62	22.62	2.249	0.30( 0.26)	0.88	2061.2	30400.00
7	5084.93	24.46	2.130	0.30( 0.26)	0.87	2299.0	30110.00
8	5233.74	27.36	1.990	0.30( 0.26)	0.87	2671.5	30300.00
9	5285.52	28.58	1.935	0.30( 0.26)	0.87	2816.3	21400.00
10	5767.82	42.49	1.562	0.30( 0.25)	0.85	4326.1	13210.00
11	5788.80	43.00	1.551	0.30( 0.25)	0.85	4378.2	13200.00
12	5793.18	44.19	1.525	0.30( 0.25)	0.85	4467.9	13100.00
13	5300.04	68.08	1.235	0.30( 0.25)	0.84	5706.0	13000.00
14	5219.47	70.34	1.220	0.30( 0.25)	0.84	5725.8	13010.00
TOTAL AREA(ACRES) = 5725.8							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 5793.18 Tc(MIN.) = 44.189  
EFFECTIVE AREA(ACRES) = 4467.86 AREA-AVERAGED Fm(INCH/HR) = 0.25  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.85  
TOTAL AREA(ACRES) = 5725.8  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13304.00 = 38920.15 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13304.00 TO NODE 13305.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 350.00 DOWNSTREAM(FEET) = 315.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2966.27 CHANNEL SLOPE = 0.0118  
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.83  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.437  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA(ACRES) Fp(INCH/HR) Ap(DECIMAL) SCS CN  
USER-DEFINED - 27.39 0.30 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5807.19  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.06  
AVERAGE FLOW DEPTH(FEET) = 6.83 TRAVEL TIME(MIN.) = 4.10  
Tc(MIN.) = 48.29



SUBAREA AREA (ACRES) = 27.39 SUBAREA RUNOFF (CFS) = 28.02  
 EFFECTIVE AREA (ACRES) = 4495.25 AREA-AVERAGED Fm (INCH/HR) = 0.25  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.85  
 TOTAL AREA (ACRES) = 5753.2 PEAK FLOW RATE (CFS) = 5793.18  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.82

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 6.82 FLOW VELOCITY (FEET/SEC.) = 12.05  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.42 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4477.17	21.51	2.320	0.30 ( 0.27)	0.89	1475.6	21300.00
2	4544.44	22.39	2.264	0.30 ( 0.27)	0.89	1553.9	30410.00
3	4656.79	24.09	2.154	0.30 ( 0.27)	0.89	1695.7	30210.00
4	4707.41	24.36	2.137	0.30 ( 0.27)	0.89	1736.0	30200.00
5	4953.22	26.25	2.040	0.30 ( 0.26)	0.88	2000.6	30100.00
6	4990.62	26.90	2.010	0.30 ( 0.26)	0.88	2088.6	30400.00
7	5084.93	28.72	1.929	0.30 ( 0.26)	0.88	2326.4	30110.00
8	5233.74	31.59	1.831	0.30 ( 0.26)	0.87	2698.9	30300.00
9	5285.52	32.79	1.801	0.30 ( 0.26)	0.87	2843.7	21400.00
10	5767.82	46.60	1.473	0.30 ( 0.26)	0.85	4353.5	13210.00
11	5788.80	47.10	1.462	0.30 ( 0.25)	0.85	4405.6	13200.00
12	5793.18	48.29	1.437	0.30 ( 0.25)	0.85	4495.3	13100.00
13	5300.04	72.29	1.207	0.30 ( 0.25)	0.84	5733.4	13000.00
14	5219.47	74.57	1.191	0.30 ( 0.25)	0.84	5753.2	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 5793.18 Tc (MIN.) = 48.29  
 AREA-AVERAGED Fm (INCH/HR) = 0.25 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.85 EFFECTIVE AREA (ACRES) = 4495.25

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610305Y.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	980.82	21.64	0.30 ( 0.30)	1.00	541.6	30520.00
2	978.86	23.00	0.30 ( 0.30)	1.00	565.1	30540.00
3	953.22	24.33	0.30 ( 0.30)	1.00	576.1	30510.00
4	923.92	25.76	0.30 ( 0.30)	1.00	582.8	30500.00

TOTAL AREA (ACRES) = 582.8

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 FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 11

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 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4477.17	21.51	2.320	0.30 ( 0.27)	0.89	1475.6	21300.00
2	4544.44	22.39	2.264	0.30 ( 0.27)	0.89	1553.9	30410.00
3	4656.79	24.09	2.154	0.30 ( 0.27)	0.89	1695.7	30210.00
4	4707.41	24.36	2.137	0.30 ( 0.27)	0.89	1736.0	30200.00
5	4953.22	26.25	2.040	0.30 ( 0.26)	0.88	2000.6	30100.00
6	4990.62	26.90	2.010	0.30 ( 0.26)	0.88	2088.6	30400.00
7	5084.93	28.72	1.929	0.30 ( 0.26)	0.88	2326.4	30110.00
8	5233.74	31.59	1.831	0.30 ( 0.26)	0.87	2698.9	30300.00
9	5285.52	32.79	1.801	0.30 ( 0.26)	0.87	2843.7	21400.00
10	5767.82	46.60	1.473	0.30 ( 0.26)	0.85	4353.5	13210.00
11	5788.80	47.10	1.462	0.30 ( 0.25)	0.85	4405.6	13200.00
12	5793.18	48.29	1.437	0.30 ( 0.25)	0.85	4495.3	13100.00
13	5300.04	72.29	1.207	0.30 ( 0.25)	0.84	5733.4	13000.00
14	5219.47	74.57	1.191	0.30 ( 0.25)	0.84	5753.2	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.42 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	980.82	21.64	2.312	0.30 ( 0.30)	1.00	541.6	30520.00
2	978.86	23.00	2.225	0.30 ( 0.30)	1.00	565.1	30540.00
3	953.22	24.33	2.139	0.30 ( 0.30)	1.00	576.1	30510.00
4	923.92	25.76	2.061	0.30 ( 0.30)	1.00	582.8	30500.00

LONGEST FLOWPATH FROM NODE 30500.00 TO NODE 13305.00 = 9458.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5456.28	21.51	2.320	0.30 ( 0.28)	0.92	2014.1	21300.00
2	5467.38	21.64	2.312	0.30 ( 0.28)	0.92	2028.1	30520.00
3	5524.18	22.39	2.264	0.30 ( 0.28)	0.92	2108.6	30410.00
4	5563.43	23.00	2.225	0.30 ( 0.28)	0.92	2169.7	30540.00
5	5614.68	24.09	2.154	0.30 ( 0.27)	0.92	2269.8	30210.00
6	5654.95	24.33	2.139	0.30 ( 0.27)	0.91	2307.6	30510.00
7	5660.00	24.36	2.137	0.30 ( 0.27)	0.91	2312.2	30200.00
8	5813.52	25.76	2.061	0.30 ( 0.27)	0.91	2515.0	30500.00
9	5865.70	26.25	2.040	0.30 ( 0.27)	0.91	2583.4	30100.00
10	5887.75	26.90	2.010	0.30 ( 0.27)	0.91	2671.4	30400.00
11	5939.48	28.72	1.929	0.30 ( 0.27)	0.90	2909.2	30110.00
12	6037.05	31.59	1.831	0.30 ( 0.27)	0.89	3281.8	30300.00
13	6072.62	32.79	1.801	0.30 ( 0.27)	0.89	3426.5	21400.00
14	6383.25	46.60	1.473	0.30 ( 0.26)	0.87	4936.3	13210.00
15	6398.49	47.10	1.462	0.30 ( 0.26)	0.87	4988.4	13200.00
16	6389.38	48.29	1.437	0.30 ( 0.26)	0.87	5078.1	13100.00
17	5775.74	72.29	1.207	0.30 ( 0.26)	0.85	6316.2	13000.00
18	5687.09	74.57	1.191	0.30 ( 0.26)	0.85	6336.1	13010.00

TOTAL AREA (ACRES) = 6336.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 6398.49 Tc (MIN.) = 47.102  
 EFFECTIVE AREA (ACRES) = 4988.44 AREA-AVERAGED Fm (INCH/HR) = 0.26

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.90  
 TOTAL AREA (ACRES) = 6336.1  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.42 FEET.

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FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.20 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 315.00 DOWNSTREAM (FEET) = 284.00  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1317.91 CHANNEL SLOPE = 0.0235  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 5.96  
 CHANNEL FLOW THRU SUBAREA (CFS) = 6398.49  
 FLOW VELOCITY (FEET/SEC.) = 15.80 FLOW DEPTH (FEET) = 5.96  
 TRAVEL TIME (MIN.) = 1.39 Tc (MIN.) = 48.49  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 = 43204.33 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5456.28	22.98	2.226	0.30 (0.28)	0.92	2014.1	21300.00
2	5467.38	23.09	2.218	0.30 (0.28)	0.92	2028.1	30520.00
3	5524.18	23.85	2.170	0.30 (0.28)	0.92	2108.6	30410.00
4	5563.43	24.45	2.131	0.30 (0.28)	0.92	2169.7	30540.00
5	5614.68	25.53	2.071	0.30 (0.27)	0.92	2269.8	30210.00
6	5654.95	25.77	2.061	0.30 (0.27)	0.91	2307.6	30510.00
7	5660.00	25.80	2.059	0.30 (0.27)	0.91	2312.2	30200.00
8	5813.52	27.19	1.998	0.30 (0.27)	0.91	2515.0	30500.00
9	5865.70	27.68	1.976	0.30 (0.27)	0.91	2583.4	30100.00
10	5887.75	28.33	1.947	0.30 (0.27)	0.91	2671.4	30400.00
11	5939.48	30.14	1.868	0.30 (0.27)	0.90	2909.2	30110.00
12	6037.05	33.00	1.795	0.30 (0.27)	0.89	3281.8	30300.00
13	6072.62	34.21	1.764	0.30 (0.27)	0.89	3426.5	21400.00
14	6383.25	47.99	1.443	0.30 (0.26)	0.87	4936.3	13210.00
15	6398.49	48.49	1.432	0.30 (0.26)	0.87	4988.4	13200.00
16	6389.38	49.68	1.406	0.30 (0.26)	0.87	5078.1	13100.00
17	5775.74	73.72	1.197	0.30 (0.26)	0.85	6316.2	13000.00
18	5687.09	76.01	1.182	0.30 (0.26)	0.85	6336.1	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 6398.49 Tc (MIN.) = 48.49  
 AREA-AVERAGED Fm (INCH/HR) = 0.26 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.87 EFFECTIVE AREA (ACRES) = 4988.44

\*\*\*\*\*

FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

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FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610306Y.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	84.17	18.06	0.30 (0.30)	1.00	40.4	30600.00
TOTAL AREA (ACRES) =			40.4			

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FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5456.28	22.98	2.226	0.30 (0.28)	0.92	2014.1	21300.00
2	5467.38	23.09	2.218	0.30 (0.28)	0.92	2028.1	30520.00
3	5524.18	23.85	2.170	0.30 (0.28)	0.92	2108.6	30410.00
4	5563.43	24.45	2.131	0.30 (0.28)	0.92	2169.7	30540.00
5	5614.68	25.53	2.071	0.30 (0.27)	0.92	2269.8	30210.00
6	5654.95	25.77	2.061	0.30 (0.27)	0.91	2307.6	30510.00
7	5660.00	25.80	2.059	0.30 (0.27)	0.91	2312.2	30200.00
8	5813.52	27.19	1.998	0.30 (0.27)	0.91	2515.0	30500.00
9	5865.70	27.68	1.976	0.30 (0.27)	0.91	2583.4	30100.00
10	5887.75	28.33	1.947	0.30 (0.27)	0.91	2671.4	30400.00
11	5939.48	30.14	1.868	0.30 (0.27)	0.90	2909.2	30110.00
12	6037.05	33.00	1.795	0.30 (0.27)	0.89	3281.8	30300.00
13	6072.62	34.21	1.764	0.30 (0.27)	0.89	3426.5	21400.00
14	6383.25	47.99	1.443	0.30 (0.26)	0.87	4936.3	13210.00
15	6398.49	48.49	1.432	0.30 (0.26)	0.87	4988.4	13200.00
16	6389.38	49.68	1.406	0.30 (0.26)	0.87	5078.1	13100.00
17	5775.74	73.72	1.197	0.30 (0.26)	0.85	6316.2	13000.00
18	5687.09	76.01	1.182	0.30 (0.26)	0.85	6336.1	13010.00
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 =			43204.33 FEET.				

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	84.17	18.06	2.618	0.30 (0.30)	1.00	40.4	30600.00
LONGEST FLOWPATH FROM NODE 30600.00 TO NODE 13305.20 =			2948.00 FEET.				

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5233.75	18.06	2.618	0.30 (0.28)	0.92	1623.2	30600.00
2	5526.22	22.98	2.226	0.30 (0.28)	0.92	2054.4	21300.00
3	5537.03	23.09	2.218	0.30 (0.28)	0.92	2068.4	30520.00
4	5592.08	23.85	2.170	0.30 (0.28)	0.92	2148.9	30410.00
5	5629.92	24.45	2.131	0.30 (0.28)	0.92	2210.1	30540.00
6	5679.01	25.53	2.071	0.30 (0.27)	0.92	2310.2	30210.00
7	5718.89	25.77	2.061	0.30 (0.27)	0.92	2347.9	30510.00
8	5723.89	25.80	2.059	0.30 (0.27)	0.92	2352.6	30200.00
9	5875.16	27.19	1.998	0.30 (0.27)	0.91	2555.3	30500.00
10	5926.55	27.68	1.976	0.30 (0.27)	0.91	2623.8	30100.00
11	5947.55	28.33	1.947	0.30 (0.27)	0.91	2711.8	30400.00
12	5996.44	30.14	1.868	0.30 (0.27)	0.90	2949.6	30110.00
13	6091.35	33.00	1.795	0.30 (0.27)	0.90	3322.1	30300.00
14	6125.80	34.21	1.764	0.30 (0.27)	0.89	3466.9	21400.00

15 6424.76 47.99 1.443 0.30( 0.26) 0.87 4976.7 13210.00  
 16 6439.60 48.49 1.432 0.30( 0.26) 0.87 5028.8 13200.00  
 17 6429.56 49.68 1.406 0.30( 0.26) 0.87 5118.4 13100.00  
 18 5808.32 73.72 1.197 0.30( 0.26) 0.86 6356.6 13000.00  
 19 5719.11 76.01 1.182 0.30( 0.26) 0.85 6376.4 13010.00  
 TOTAL AREA (ACRES) = 6376.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 6439.60 Tc(MIN.) = 48.492  
 EFFECTIVE AREA(ACRES) = 5028.79 AREA-AVERAGED Fm(INCH/HR) = 0.26  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.87  
 TOTAL AREA(ACRES) = 6376.4  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 = 43204.33 FEET.

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 FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.40 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
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ELEVATION DATA: UPSTREAM(FEET) = 284.00 DOWNSTREAM(FEET) = 274.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 826.37 CHANNEL SLOPE = 0.0121  
 GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 7.17  
 CHANNEL FLOW THRU SUBAREA(CFS) = 6439.60  
 FLOW VELOCITY(FEET/SEC.) = 12.55 FLOW DEPTH(FEET) = 7.17  
 TRAVEL TIME(MIN.) = 1.10 Tc(MIN.) = 49.59  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.40 = 44030.70 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5233.75	19.22	2.498	0.30( 0.28)	0.92	1623.2	30600.00
2	5526.22	24.12	2.152	0.30( 0.28)	0.92	2054.4	21300.00
3	5537.03	24.24	2.144	0.30( 0.28)	0.92	2068.4	30520.00
4	5592.08	24.99	2.096	0.30( 0.28)	0.92	2148.9	30410.00
5	5629.92	25.59	2.069	0.30( 0.28)	0.92	2210.1	30540.00
6	5679.01	26.67	2.021	0.30( 0.27)	0.92	2310.2	30210.00
7	5718.89	26.91	2.010	0.30( 0.27)	0.92	2347.9	30510.00
8	5723.89	26.94	2.009	0.30( 0.27)	0.92	2352.6	30200.00
9	5875.16	28.32	1.947	0.30( 0.27)	0.91	2555.3	30500.00
10	5926.55	28.80	1.926	0.30( 0.27)	0.91	2623.8	30100.00
11	5947.55	29.45	1.897	0.30( 0.27)	0.91	2711.8	30400.00
12	5996.44	31.26	1.840	0.30( 0.27)	0.90	2949.6	30110.00
13	6091.35	34.12	1.767	0.30( 0.27)	0.90	3322.1	30300.00
14	6125.80	35.32	1.736	0.30( 0.27)	0.89	3466.9	21400.00
15	6424.76	49.09	1.419	0.30( 0.26)	0.87	4976.7	13210.00
16	6439.60	49.59	1.408	0.30( 0.26)	0.87	5028.8	13200.00
17	6429.56	50.78	1.391	0.30( 0.26)	0.87	5118.4	13100.00
18	5808.32	74.85	1.190	0.30( 0.26)	0.86	6356.6	13000.00
19	5719.11	77.15	1.174	0.30( 0.26)	0.85	6376.4	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 6439.60 Tc(MIN.) = 49.59  
 AREA-AVERAGED Fm(INCH/HR) = 0.26 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.87 EFFECTIVE AREA(ACRES) = 5028.79

\*\*\*\*\*

FLOW PROCESS FROM NODE 13305.40 TO NODE 13305.40 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<  
 =====

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.40 TO NODE 13305.40 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<  
 =====

PEAK FLOWRATE TABLE FILE NAME: 0610307Y.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	210.43	17.39	0.30( 0.30)	1.00	98.0	30700.00
TOTAL AREA(ACRES) = 98.0						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.40 TO NODE 13305.40 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<  
 =====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5233.75	19.22	2.498	0.30( 0.28)	0.92	1623.2	30600.00
2	5526.22	24.12	2.152	0.30( 0.28)	0.92	2054.4	21300.00
3	5537.03	24.24	2.144	0.30( 0.28)	0.92	2068.4	30520.00
4	5592.08	24.99	2.096	0.30( 0.28)	0.92	2148.9	30410.00
5	5629.92	25.59	2.069	0.30( 0.28)	0.92	2210.1	30540.00
6	5679.01	26.67	2.021	0.30( 0.27)	0.92	2310.2	30210.00
7	5718.89	26.91	2.010	0.30( 0.27)	0.92	2347.9	30510.00
8	5723.89	26.94	2.009	0.30( 0.27)	0.92	2352.6	30200.00
9	5875.16	28.32	1.947	0.30( 0.27)	0.91	2555.3	30500.00
10	5926.55	28.80	1.926	0.30( 0.27)	0.91	2623.8	30100.00
11	5947.55	29.45	1.897	0.30( 0.27)	0.91	2711.8	30400.00
12	5996.44	31.26	1.840	0.30( 0.27)	0.90	2949.6	30110.00
13	6091.35	34.12	1.767	0.30( 0.27)	0.90	3322.1	30300.00
14	6125.80	35.32	1.736	0.30( 0.27)	0.89	3466.9	21400.00
15	6424.76	49.09	1.419	0.30( 0.26)	0.87	4976.7	13210.00
16	6439.60	49.59	1.408	0.30( 0.26)	0.87	5028.8	13200.00
17	6429.56	50.78	1.391	0.30( 0.26)	0.87	5118.4	13100.00
18	5808.32	74.85	1.190	0.30( 0.26)	0.86	6356.6	13000.00
19	5719.11	77.15	1.174	0.30( 0.26)	0.85	6376.4	13010.00
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.40 = 44030.70 FEET.							

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	210.43	17.39	2.686	0.30( 0.30)	1.00	98.0	30700.00
LONGEST FLOWPATH FROM NODE 30700.00 TO NODE 13305.40 = 5192.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5346.76	17.39	2.686	0.30( 0.28)	0.93	1566.6	30700.00
2	5427.59	19.22	2.498	0.30( 0.28)	0.93	1721.2	30600.00

3	5689.54	24.12	2.152	0.30	( 0.28)	0.92	2152.4	21300.00
4	5699.68	24.24	2.144	0.30	( 0.28)	0.92	2166.4	30520.00
5	5750.47	24.99	2.096	0.30	( 0.28)	0.92	2246.9	30410.00
6	5785.94	25.59	2.069	0.30	( 0.28)	0.92	2308.1	30540.00
7	5830.76	26.67	2.021	0.30	( 0.28)	0.92	2408.2	30210.00
8	5869.71	26.91	2.010	0.30	( 0.28)	0.92	2445.9	30510.00
9	5874.59	26.94	2.009	0.30	( 0.28)	0.92	2450.6	30200.00
10	6020.43	28.32	1.947	0.30	( 0.27)	0.91	2653.3	30500.00
11	6069.92	28.80	1.926	0.30	( 0.27)	0.91	2721.8	30100.00
12	6088.36	29.45	1.897	0.30	( 0.27)	0.91	2809.8	30400.00
13	6132.23	31.26	1.840	0.30	( 0.27)	0.91	3047.6	30110.00
14	6220.70	34.12	1.767	0.30	( 0.27)	0.90	3420.1	30300.00
15	6252.45	35.32	1.736	0.30	( 0.27)	0.90	3564.9	21400.00
16	6523.48	49.09	1.419	0.30	( 0.26)	0.87	5074.7	13210.00
17	6537.36	49.59	1.408	0.30	( 0.26)	0.87	5126.8	13200.00
18	6525.78	50.78	1.391	0.30	( 0.26)	0.87	5216.4	13100.00
19	5886.78	74.85	1.190	0.30	( 0.26)	0.86	6454.6	13000.00
20	5796.21	77.15	1.174	0.30	( 0.26)	0.86	6474.4	13010.00
TOTAL AREA (ACRES) =								6474.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 6537.36 Tc(MIN.) = 49.589  
EFFECTIVE AREA(ACRES) = 5126.79 AREA-AVERAGED Fm(INCH/HR) = 0.26  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.87  
TOTAL AREA(ACRES) = 6474.4  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.40 = 44030.70 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13305.40 TO NODE 13305.60 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

\*\*\*\*\*  
ELEVATION DATA: UPSTREAM(FEET) = 274.00 DOWNSTREAM(FEET) = 258.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 733.85 CHANNEL SLOPE = 0.0218  
GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.16  
CHANNEL FLOW THRU SUBAREA(CFS) = 6537.36  
FLOW VELOCITY(FEET/SEC.) = 15.49 FLOW DEPTH(FEET) = 6.16  
TRAVEL TIME(MIN.) = 0.79 Tc(MIN.) = 50.38  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.60 = 44764.55 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5346.76	18.23	2.600	0.30( 0.28)	0.93	1566.6	30700.00
2	5427.59	20.06	2.414	0.30( 0.28)	0.93	1721.2	30600.00
3	5689.54	24.95	2.099	0.30( 0.28)	0.92	2152.4	21300.00
4	5699.68	25.07	2.092	0.30( 0.28)	0.92	2166.4	30520.00
5	5750.47	25.81	2.059	0.30( 0.28)	0.92	2246.9	30410.00
6	5785.94	26.41	2.032	0.30( 0.28)	0.92	2308.1	30540.00
7	5830.76	27.49	1.984	0.30( 0.28)	0.92	2408.2	30210.00
8	5869.71	27.73	1.974	0.30( 0.28)	0.92	2445.9	30510.00
9	5874.59	27.76	1.972	0.30( 0.28)	0.92	2450.6	30200.00
10	6020.43	29.13	1.911	0.30( 0.27)	0.91	2653.3	30500.00
11	6069.92	29.61	1.890	0.30( 0.27)	0.91	2721.8	30100.00
12	6088.36	30.26	1.865	0.30( 0.27)	0.91	2809.8	30400.00

13	6132.23	32.07	1.819	0.30	( 0.27)	0.91	3047.6	30110.00
14	6220.70	34.92	1.746	0.30	( 0.27)	0.90	3420.1	30300.00
15	6252.45	36.12	1.715	0.30	( 0.27)	0.90	3564.9	21400.00
16	6523.48	49.88	1.402	0.30	( 0.26)	0.87	5074.7	13210.00
17	6537.36	50.38	1.395	0.30	( 0.26)	0.87	5126.8	13200.00
18	6525.78	51.57	1.382	0.30	( 0.26)	0.87	5216.4	13100.00
19	5886.78	75.67	1.184	0.30	( 0.26)	0.86	6454.6	13000.00
20	5796.21	77.97	1.169	0.30	( 0.26)	0.86	6474.4	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 6537.36 Tc(MIN.) = 50.38  
AREA-AVERAGED Fm(INCH/HR) = 0.26 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.87 EFFECTIVE AREA(ACRES) = 5126.79

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.60 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.60 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610308Y.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	141.62	16.99	0.30( 0.30)	1.00	64.8	30800.00
TOTAL AREA(ACRES) =						64.8

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.60 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5346.76	18.23	2.600	0.30( 0.28)	0.93	1566.6	30700.00
2	5427.59	20.06	2.414	0.30( 0.28)	0.93	1721.2	30600.00
3	5689.54	24.95	2.099	0.30( 0.28)	0.92	2152.4	21300.00
4	5699.68	25.07	2.092	0.30( 0.28)	0.92	2166.4	30520.00
5	5750.47	25.81	2.059	0.30( 0.28)	0.92	2246.9	30410.00
6	5785.94	26.41	2.032	0.30( 0.28)	0.92	2308.1	30540.00
7	5830.76	27.49	1.984	0.30( 0.28)	0.92	2408.2	30210.00
8	5869.71	27.73	1.974	0.30( 0.28)	0.92	2445.9	30510.00
9	5874.59	27.76	1.972	0.30( 0.28)	0.92	2450.6	30200.00
10	6020.43	29.13	1.911	0.30( 0.27)	0.91	2653.3	30500.00
11	6069.92	29.61	1.890	0.30( 0.27)	0.91	2721.8	30100.00
12	6088.36	30.26	1.865	0.30( 0.27)	0.91	2809.8	30400.00
13	6132.23	32.07	1.819	0.30( 0.27)	0.91	3047.6	30110.00
14	6220.70	34.92	1.746	0.30( 0.27)	0.90	3420.1	30300.00
15	6252.45	36.12	1.715	0.30( 0.27)	0.90	3564.9	21400.00
16	6523.48	49.88	1.402	0.30( 0.26)	0.87	5074.7	13210.00
17	6537.36	50.38	1.395	0.30( 0.26)	0.87	5126.8	13200.00
18	6525.78	51.57	1.382	0.30( 0.26)	0.87	5216.4	13100.00

19 5886.78 75.67 1.184 0.30( 0.26) 0.86 6454.6 13000.00  
 20 5796.21 77.97 1.169 0.30( 0.26) 0.86 6474.4 13010.00  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.60 = 44764.55 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	141.62	16.99	2.728	0.30( 0.30)	1.00	64.8	30800.00

LONGEST FLOWPATH FROM NODE 30800.00 TO NODE 13305.60 = 4165.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5397.77	16.99	2.728	0.30( 0.28)	0.93	1524.5	30800.00
2	5480.92	18.23	2.600	0.30( 0.28)	0.93	1631.5	30700.00
3	5550.93	20.06	2.414	0.30( 0.28)	0.93	1786.0	30600.00
4	5794.47	24.95	2.099	0.30( 0.28)	0.93	2217.3	21300.00
5	5804.24	25.07	2.092	0.30( 0.28)	0.93	2231.3	30520.00
6	5853.09	25.81	2.059	0.30( 0.28)	0.93	2311.7	30410.00
7	5887.00	26.41	2.032	0.30( 0.28)	0.92	2372.9	30540.00
8	5929.00	27.49	1.984	0.30( 0.28)	0.92	2473.0	30210.00
9	5967.34	27.73	1.974	0.30( 0.28)	0.92	2510.8	30510.00
10	5972.15	27.76	1.972	0.30( 0.28)	0.92	2515.4	30200.00
11	6114.41	29.13	1.911	0.30( 0.27)	0.92	2718.2	30500.00
12	6162.65	29.61	1.890	0.30( 0.27)	0.91	2786.6	30100.00
13	6179.68	30.26	1.865	0.30( 0.27)	0.91	2874.6	30400.00
14	6220.86	32.07	1.819	0.30( 0.27)	0.91	3112.4	30110.00
15	6305.07	34.92	1.746	0.30( 0.27)	0.90	3484.9	30300.00
16	6335.02	36.12	1.715	0.30( 0.27)	0.90	3629.7	21400.00
17	6587.78	49.88	1.402	0.30( 0.26)	0.87	5139.5	13210.00
18	6601.27	50.38	1.395	0.30( 0.26)	0.87	5191.6	13200.00
19	6588.93	51.57	1.382	0.30( 0.26)	0.87	5281.3	13100.00
20	5938.36	75.67	1.184	0.30( 0.26)	0.86	6519.4	13000.00
21	5846.88	77.97	1.169	0.30( 0.26)	0.86	6539.3	13010.00

TOTAL AREA (ACRES) = 6539.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 6601.27 Tc(MIN.) = 50.379  
 EFFECTIVE AREA(ACRES) = 5191.62 AREA-AVERAGED Fm(INCH/HR) = 0.26  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.87  
 TOTAL AREA(ACRES) = 6539.3  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.60 = 44764.55 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.80 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 258.00 DOWNSTREAM(FEET) = 254.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 947.16 CHANNEL SLOPE = 0.0042  
 GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 9.62  
 CHANNEL FLOW THRU SUBAREA(CFS) = 6601.27  
 FLOW VELOCITY(FEET/SEC.) = 8.70 FLOW DEPTH(FEET) = 9.62  
 TRAVEL TIME(MIN.) = 1.81 Tc(MIN.) = 52.19  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.80 = 45711.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5397.77	18.91	2.530	0.30( 0.28)	0.93	1524.5	30800.00
2	5480.92	20.15	2.409	0.30( 0.28)	0.93	1631.5	30700.00
3	5550.93	21.97	2.291	0.30( 0.28)	0.93	1786.0	30600.00
4	5794.47	26.83	2.014	0.30( 0.28)	0.93	2217.3	21300.00
5	5804.24	26.95	2.008	0.30( 0.28)	0.93	2231.3	30520.00
6	5853.09	27.69	1.975	0.30( 0.28)	0.93	2311.7	30410.00
7	5887.00	28.28	1.949	0.30( 0.28)	0.92	2372.9	30540.00
8	5929.00	29.36	1.901	0.30( 0.28)	0.92	2473.0	30210.00
9	5967.34	29.59	1.890	0.30( 0.28)	0.92	2510.8	30510.00
10	5972.15	29.62	1.889	0.30( 0.28)	0.92	2515.4	30200.00
11	6114.41	30.98	1.847	0.30( 0.27)	0.92	2718.2	30500.00
12	6162.65	31.46	1.835	0.30( 0.27)	0.91	2786.6	30100.00
13	6179.68	32.11	1.818	0.30( 0.27)	0.91	2874.6	30400.00
14	6220.86	33.91	1.772	0.30( 0.27)	0.91	3112.4	30110.00
15	6305.07	36.76	1.699	0.30( 0.27)	0.90	3484.9	30300.00
16	6335.02	37.96	1.668	0.30( 0.27)	0.90	3629.7	21400.00
17	6587.78	51.69	1.381	0.30( 0.26)	0.87	5139.5	13210.00
18	6601.27	52.19	1.375	0.30( 0.26)	0.87	5191.6	13200.00
19	6588.93	53.38	1.362	0.30( 0.26)	0.87	5281.3	13100.00
20	5938.36	77.54	1.171	0.30( 0.26)	0.86	6519.4	13000.00
21	5846.88	79.84	1.156	0.30( 0.26)	0.86	6539.3	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 6601.27 Tc(MIN.) = 52.19  
 AREA-AVERAGED Fm(INCH/HR) = 0.26 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.87 EFFECTIVE AREA(ACRES) = 5191.62

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.80 TO NODE 13305.80 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.80 TO NODE 13305.80 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610309Y.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	145.65	16.70	0.30( 0.30)	1.00	65.9	30900.00
2	145.49	16.74	0.30( 0.30)	1.00	65.9	30910.00

TOTAL AREA(ACRES) = 65.9

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.80 TO NODE 13305.80 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
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1	5397.77	18.91	2.530	0.30 ( 0.28)	0.93	1524.5	30800.00
2	5480.92	20.15	2.409	0.30 ( 0.28)	0.93	1631.5	30700.00
3	5550.93	21.97	2.291	0.30 ( 0.28)	0.93	1786.0	30600.00
4	5794.47	26.83	2.014	0.30 ( 0.28)	0.93	2217.3	21300.00
5	5804.24	26.95	2.008	0.30 ( 0.28)	0.93	2231.3	30520.00
6	5853.09	27.69	1.975	0.30 ( 0.28)	0.93	2311.7	30410.00
7	5887.00	28.28	1.949	0.30 ( 0.28)	0.92	2372.9	30540.00
8	5929.00	29.36	1.901	0.30 ( 0.28)	0.92	2473.0	30210.00
9	5967.34	29.59	1.890	0.30 ( 0.28)	0.92	2510.8	30510.00
10	5972.15	29.62	1.889	0.30 ( 0.28)	0.92	2515.4	30200.00
11	6114.41	30.98	1.847	0.30 ( 0.27)	0.92	2718.2	30500.00
12	6162.65	31.46	1.835	0.30 ( 0.27)	0.91	2786.6	30100.00
13	6179.68	32.11	1.818	0.30 ( 0.27)	0.91	2874.6	30400.00
14	6220.86	33.91	1.772	0.30 ( 0.27)	0.91	3112.4	30110.00
15	6305.07	36.76	1.699	0.30 ( 0.27)	0.90	3484.9	30300.00
16	6335.02	37.96	1.668	0.30 ( 0.27)	0.90	3629.7	21400.00
17	6587.78	51.69	1.381	0.30 ( 0.26)	0.87	5139.5	13210.00
18	6601.27	52.19	1.375	0.30 ( 0.26)	0.87	5191.6	13200.00
19	6588.93	53.38	1.362	0.30 ( 0.26)	0.87	5281.3	13100.00
20	5938.36	77.54	1.171	0.30 ( 0.26)	0.86	6519.4	13000.00
21	5846.88	79.84	1.156	0.30 ( 0.26)	0.86	6539.3	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.80 = 45711.71 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	145.65	16.70	2.757	0.30 ( 0.30)	1.00	65.9	30900.00
2	145.49	16.74	2.753	0.30 ( 0.30)	1.00	65.9	30910.00

LONGEST FLOWPATH FROM NODE 30900.00 TO NODE 13305.80 = 3403.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5393.48	16.70	2.757	0.30 ( 0.28)	0.93	1412.3	30900.00
2	5397.52	16.74	2.753	0.30 ( 0.28)	0.93	1415.8	30910.00
3	5530.06	18.91	2.530	0.30 ( 0.28)	0.93	1590.4	30800.00
4	5605.99	20.15	2.409	0.30 ( 0.28)	0.93	1697.4	30700.00
5	5669.04	21.97	2.291	0.30 ( 0.28)	0.93	1852.0	30600.00
6	5896.11	26.83	2.014	0.30 ( 0.28)	0.93	2283.2	21300.00
7	5905.57	26.95	2.008	0.30 ( 0.28)	0.93	2297.2	30520.00
8	5952.46	27.69	1.975	0.30 ( 0.28)	0.93	2377.6	30410.00
9	5984.80	28.28	1.949	0.30 ( 0.28)	0.93	2438.8	30540.00
10	6023.95	29.36	1.901	0.30 ( 0.28)	0.92	2538.9	30210.00
11	6061.67	29.59	1.890	0.30 ( 0.28)	0.92	2576.7	30510.00
12	6066.40	29.62	1.889	0.30 ( 0.28)	0.92	2581.3	30200.00
13	6206.18	30.98	1.847	0.30 ( 0.28)	0.92	2784.1	30500.00
14	6253.69	31.46	1.835	0.30 ( 0.27)	0.92	2852.5	30100.00
15	6269.74	32.11	1.818	0.30 ( 0.27)	0.91	2940.5	30400.00
16	6308.17	33.91	1.772	0.30 ( 0.27)	0.91	3178.3	30110.00
17	6388.07	36.76	1.699	0.30 ( 0.27)	0.90	3550.8	30300.00
18	6416.20	37.96	1.668	0.30 ( 0.27)	0.90	3695.6	21400.00
19	6651.90	51.69	1.381	0.30 ( 0.26)	0.88	5205.4	13210.00
20	6665.06	52.19	1.375	0.30 ( 0.26)	0.87	5257.5	13200.00
21	6651.95	53.38	1.362	0.30 ( 0.26)	0.87	5347.2	13100.00
22	5990.05	77.54	1.171	0.30 ( 0.26)	0.86	6585.3	13000.00
23	5897.65	79.84	1.156	0.30 ( 0.26)	0.86	6605.2	13010.00

TOTAL AREA (ACRES) = 6605.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE (CFS) = 6665.06 Tc (MIN.) = 52.192  
 EFFECTIVE AREA (ACRES) = 5257.54 AREA-AVERAGED Fm (INCH/HR) = 0.26  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.90  
 TOTAL AREA (ACRES) = 6605.2  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.80 = 45711.71 FEET.

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FLOW PROCESS FROM NODE 13305.80 TO NODE 13306.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 254.00 DOWNSTREAM (FEET) = 245.50  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 583.12 CHANNEL SLOPE = 0.0146  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.98  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.368  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	68.77	0.30	0.998	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.998  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 6698.12  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 13.56  
 AVERAGE FLOW DEPTH (FEET) = 6.97 TRAVEL TIME (MIN.) = 0.72  
 Tc (MIN.) = 52.91

SUBAREA AREA (ACRES) = 68.77 SUBAREA RUNOFF (CFS) = 66.12  
 EFFECTIVE AREA (ACRES) = 5326.31 AREA-AVERAGED Fm (INCH/HR) = 0.26  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.88  
 TOTAL AREA (ACRES) = 6673.9 PEAK FLOW RATE (CFS) = 6665.06  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.95

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 6.95 FLOW VELOCITY (FEET/SEC.) = 13.53  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13306.00 = 46294.83 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5393.48	17.46	2.679	0.30 ( 0.28)	0.94	1481.0	30900.00
2	5397.52	17.51	2.674	0.30 ( 0.28)	0.94	1484.6	30910.00
3	5530.06	19.67	2.452	0.30 ( 0.28)	0.93	1659.2	30800.00
4	5605.99	20.90	2.360	0.30 ( 0.28)	0.93	1766.2	30700.00
5	5669.04	22.72	2.243	0.30 ( 0.28)	0.93	1920.7	30600.00
6	5896.11	27.57	1.980	0.30 ( 0.28)	0.93	2352.0	21300.00
7	5905.57	27.69	1.975	0.30 ( 0.28)	0.93	2365.9	30520.00
8	5952.46	28.43	1.942	0.30 ( 0.28)	0.93	2446.4	30410.00
9	5984.80	29.02	1.916	0.30 ( 0.28)	0.93	2507.6	30540.00
10	6023.95	30.10	1.870	0.30 ( 0.28)	0.93	2607.7	30210.00
11	6061.67	30.33	1.864	0.30 ( 0.28)	0.93	2645.4	30510.00
12	6066.40	30.36	1.863	0.30 ( 0.28)	0.93	2650.1	30200.00
13	6206.18	31.71	1.828	0.30 ( 0.28)	0.92	2852.8	30500.00

14	6253.69	32.19	1.816	0.30 ( 0.28)	0.92	2921.3	30100.00
15	6269.74	32.84	1.800	0.30 ( 0.27)	0.92	3009.3	30400.00
16	6308.17	34.64	1.753	0.30 ( 0.27)	0.91	3247.1	30110.00
17	6388.07	37.48	1.681	0.30 ( 0.27)	0.90	3619.6	30300.00
18	6416.20	38.68	1.650	0.30 ( 0.27)	0.90	3764.4	21400.00
19	6651.90	52.41	1.373	0.30 ( 0.26)	0.88	5274.2	13210.00
20	6665.06	52.91	1.368	0.30 ( 0.26)	0.88	5326.3	13200.00
21	6651.95	54.10	1.355	0.30 ( 0.26)	0.87	5416.0	13100.00
22	5990.05	78.28	1.166	0.30 ( 0.26)	0.86	6654.1	13000.00
23	5897.65	80.59	1.151	0.30 ( 0.26)	0.86	6673.9	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 6665.06 Tc(MIN.) = 52.91  
 AREA-AVERAGED Fm(INCH/HR) = 0.26 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.88 EFFECTIVE AREA(ACRES) = 5326.31

\*\*\*\*\*

FLOW PROCESS FROM NODE 13306.00 TO NODE 13307.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 245.50 DOWNSTREAM(FEET) = 220.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1543.21 CHANNEL SLOPE = 0.0165  
 GIVEN CHANNEL BASE(FEET) = 50.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 6.72  
 CHANNEL FLOW THRU SUBAREA(CFS) = 6665.06  
 FLOW VELOCITY(FEET/SEC.) = 14.14 FLOW DEPTH(FEET) = 6.72  
 TRAVEL TIME(MIN.) = 1.82 Tc(MIN.) = 54.73  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13307.00 = 47838.04 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5393.48	19.40	2.480	0.30 ( 0.28)	0.94	1481.0	30900.00
2	5397.52	19.45	2.475	0.30 ( 0.28)	0.94	1484.6	30910.00
3	5530.06	21.59	2.315	0.30 ( 0.28)	0.93	1659.2	30800.00
4	5605.99	22.82	2.236	0.30 ( 0.28)	0.93	1766.2	30700.00
5	5669.04	24.63	2.119	0.30 ( 0.28)	0.93	1920.7	30600.00
6	5896.11	29.46	1.896	0.30 ( 0.28)	0.93	2352.0	21300.00
7	5905.57	29.58	1.891	0.30 ( 0.28)	0.93	2365.9	30520.00
8	5952.46	30.31	1.864	0.30 ( 0.28)	0.93	2446.4	30410.00
9	5984.80	30.90	1.849	0.30 ( 0.28)	0.93	2507.6	30540.00
10	6023.95	31.97	1.822	0.30 ( 0.28)	0.93	2607.7	30210.00
11	6061.67	32.20	1.816	0.30 ( 0.28)	0.93	2645.4	30510.00
12	6066.40	32.23	1.815	0.30 ( 0.28)	0.93	2650.1	30200.00
13	6206.18	33.57	1.781	0.30 ( 0.28)	0.92	2852.8	30500.00
14	6253.69	34.04	1.769	0.30 ( 0.28)	0.92	2921.3	30100.00
15	6269.74	34.69	1.752	0.30 ( 0.27)	0.92	3009.3	30400.00
16	6308.17	36.49	1.706	0.30 ( 0.27)	0.91	3247.1	30110.00
17	6388.07	39.33	1.633	0.30 ( 0.27)	0.90	3619.6	30300.00
18	6416.20	40.52	1.605	0.30 ( 0.27)	0.90	3764.4	21400.00
19	6651.90	54.23	1.353	0.30 ( 0.26)	0.88	5274.2	13210.00
20	6665.06	54.73	1.348	0.30 ( 0.26)	0.88	5326.3	13200.00
21	6651.95	55.92	1.335	0.30 ( 0.26)	0.87	5416.0	13100.00
22	5990.05	80.16	1.154	0.30 ( 0.26)	0.86	6654.1	13000.00
23	5897.65	82.47	1.138	0.30 ( 0.26)	0.86	6673.9	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 6665.06 Tc(MIN.) = 54.73  
 AREA-AVERAGED Fm(INCH/HR) = 0.26 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.88 EFFECTIVE AREA(ACRES) = 5326.31

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FLOW PROCESS FROM NODE 13307.00 TO NODE 13307.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<

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FLOW PROCESS FROM NODE 13307.00 TO NODE 13307.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<

PEAK FLOWRATE TABLE FILE NAME: 0610310Y.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	182.13	20.79	0.30 ( 0.30)	1.00	97.9	31000.00
TOTAL AREA(ACRES) =						97.9

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FLOW PROCESS FROM NODE 13307.00 TO NODE 13307.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5393.48	19.40	2.480	0.30 ( 0.28)	0.94	1481.0	30900.00
2	5397.52	19.45	2.475	0.30 ( 0.28)	0.94	1484.6	30910.00
3	5530.06	21.59	2.315	0.30 ( 0.28)	0.93	1659.2	30800.00
4	5605.99	22.82	2.236	0.30 ( 0.28)	0.93	1766.2	30700.00
5	5669.04	24.63	2.119	0.30 ( 0.28)	0.93	1920.7	30600.00
6	5896.11	29.46	1.896	0.30 ( 0.28)	0.93	2352.0	21300.00
7	5905.57	29.58	1.891	0.30 ( 0.28)	0.93	2365.9	30520.00
8	5952.46	30.31	1.864	0.30 ( 0.28)	0.93	2446.4	30410.00
9	5984.80	30.90	1.849	0.30 ( 0.28)	0.93	2507.6	30540.00
10	6023.95	31.97	1.822	0.30 ( 0.28)	0.93	2607.7	30210.00
11	6061.67	32.20	1.816	0.30 ( 0.28)	0.93	2645.4	30510.00
12	6066.40	32.23	1.815	0.30 ( 0.28)	0.93	2650.1	30200.00
13	6206.18	33.57	1.781	0.30 ( 0.28)	0.92	2852.8	30500.00
14	6253.69	34.04	1.769	0.30 ( 0.28)	0.92	2921.3	30100.00
15	6269.74	34.69	1.752	0.30 ( 0.27)	0.92	3009.3	30400.00
16	6308.17	36.49	1.706	0.30 ( 0.27)	0.91	3247.1	30110.00
17	6388.07	39.33	1.633	0.30 ( 0.27)	0.90	3619.6	30300.00
18	6416.20	40.52	1.605	0.30 ( 0.27)	0.90	3764.4	21400.00
19	6651.90	54.23	1.353	0.30 ( 0.26)	0.88	5274.2	13210.00
20	6665.06	54.73	1.348	0.30 ( 0.26)	0.88	5326.3	13200.00
21	6651.95	55.92	1.335	0.30 ( 0.26)	0.87	5416.0	13100.00
22	5990.05	80.16	1.154	0.30 ( 0.26)	0.86	6654.1	13000.00
23	5897.65	82.47	1.138	0.30 ( 0.26)	0.86	6673.9	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13307.00 = 47838.04 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
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NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE  
 1 182.13 20.79 2.367 0.30 ( 0.30) 1.00 97.9 31000.00  
 LONGEST FLOWPATH FROM NODE 31000.00 TO NODE 13307.00 = 5162.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5572.69	19.40	2.480	0.30 ( 0.28)	0.94	1572.4	30900.00
2	5576.75	19.45	2.475	0.30 ( 0.28)	0.94	1576.1	30910.00
3	5662.99	20.79	2.367	0.30 ( 0.28)	0.94	1692.2	31000.00
4	5707.66	21.59	2.315	0.30 ( 0.28)	0.94	1757.0	30800.00
5	5776.61	22.82	2.236	0.30 ( 0.28)	0.94	1864.0	30700.00
6	5829.36	24.63	2.119	0.30 ( 0.28)	0.94	2018.6	30600.00
7	6036.78	29.46	1.896	0.30 ( 0.28)	0.93	2449.8	21300.00
8	6045.78	29.58	1.891	0.30 ( 0.28)	0.93	2463.8	30520.00
9	6090.31	30.31	1.864	0.30 ( 0.28)	0.93	2544.3	30410.00
10	6121.32	30.90	1.849	0.30 ( 0.28)	0.93	2605.4	30540.00
11	6158.05	31.97	1.822	0.30 ( 0.28)	0.93	2705.6	30210.00
12	6195.26	32.20	1.816	0.30 ( 0.28)	0.93	2743.3	30510.00
13	6199.92	32.23	1.815	0.30 ( 0.28)	0.93	2748.0	30200.00
14	6336.67	33.57	1.781	0.30 ( 0.28)	0.92	2950.7	30500.00
15	6383.13	34.04	1.769	0.30 ( 0.28)	0.92	3019.2	30100.00
16	6397.72	34.69	1.752	0.30 ( 0.28)	0.92	3107.2	30400.00
17	6432.09	36.49	1.706	0.30 ( 0.27)	0.91	3345.0	30110.00
18	6505.60	39.33	1.633	0.30 ( 0.27)	0.91	3717.5	30300.00
19	6531.22	40.52	1.605	0.30 ( 0.27)	0.90	3862.3	21400.00
20	6744.75	54.23	1.353	0.30 ( 0.26)	0.88	5372.1	13210.00
21	6757.42	54.73	1.348	0.30 ( 0.26)	0.88	5424.2	13200.00
22	6743.15	55.92	1.335	0.30 ( 0.26)	0.88	5513.8	13100.00
23	6065.33	80.16	1.154	0.30 ( 0.26)	0.86	6752.0	13000.00
24	5971.55	82.47	1.138	0.30 ( 0.26)	0.86	6771.8	13010.00
TOTAL AREA (ACRES) =			6771.8				

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 6757.42 Tc (MIN.) = 54.728  
 EFFECTIVE AREA (ACRES) = 5424.19 AREA-AVERAGED Fm (INCH/HR) = 0.26  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.88  
 TOTAL AREA (ACRES) = 6771.8  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13307.00 = 47838.04 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13307.00 TO NODE 13308.00 IS CODE = 56  
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>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>> TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 220.00 DOWNSTREAM (FEET) = 212.00  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 925.62 CHANNEL SLOPE = 0.0086  
 GIVEN CHANNEL BASE (FEET) = 50.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 8.06  
 CHANNEL FLOW THRU SUBAREA (CFS) = 6757.42  
 FLOW VELOCITY (FEET/SEC.) = 11.30 FLOW DEPTH (FEET) = 8.06  
 TRAVEL TIME (MIN.) = 1.36 Tc (MIN.) = 56.09  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.66 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5572.69	20.85	2.363	0.30 ( 0.28)	0.94	1572.4	30900.00

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE
1	5572.69	20.85	2.363	0.30 ( 0.28)	0.94	1572.4 30900.00
2	5576.75	20.89	2.361	0.30 ( 0.28)	0.94	1576.1 30910.00
3	5662.99	22.23	2.274	0.30 ( 0.28)	0.94	1692.2 31000.00
4	5707.66	23.02	2.223	0.30 ( 0.28)	0.94	1757.0 30800.00
5	5776.61	24.25	2.144	0.30 ( 0.28)	0.94	1864.0 30700.00
6	5829.36	26.05	2.048	0.30 ( 0.28)	0.94	2018.6 30600.00
7	6036.78	30.87	1.850	0.30 ( 0.28)	0.93	2449.8 21300.00
8	6045.78	30.99	1.847	0.30 ( 0.28)	0.93	2463.8 30520.00
9	6090.31	31.72	1.828	0.30 ( 0.28)	0.93	2544.3 30410.00
10	6121.32	32.31	1.813	0.30 ( 0.28)	0.93	2605.4 30540.00
11	6158.05	33.38	1.786	0.30 ( 0.28)	0.93	2705.6 30210.00
12	6195.26	33.60	1.780	0.30 ( 0.28)	0.93	2743.3 30510.00
13	6199.92	33.63	1.779	0.30 ( 0.28)	0.93	2748.0 30200.00
14	6336.67	34.96	1.745	0.30 ( 0.28)	0.92	2950.7 30500.00
15	6383.13	35.43	1.733	0.30 ( 0.28)	0.92	3019.2 30100.00
16	6397.72	36.07	1.717	0.30 ( 0.28)	0.92	3107.2 30400.00
17	6432.09	37.88	1.671	0.30 ( 0.27)	0.91	3345.0 30110.00
18	6505.60	40.71	1.601	0.30 ( 0.27)	0.91	3717.5 30300.00
19	6531.22	41.90	1.575	0.30 ( 0.27)	0.90	3862.3 21400.00
20	6744.75	55.59	1.338	0.30 ( 0.26)	0.88	5372.1 13210.00
21	6757.42	56.09	1.333	0.30 ( 0.26)	0.88	5424.2 13200.00
22	6743.15	57.29	1.320	0.30 ( 0.26)	0.88	5513.8 13100.00
23	6065.33	81.57	1.144	0.30 ( 0.26)	0.86	6752.0 13000.00
24	5971.55	83.89	1.129	0.30 ( 0.26)	0.86	6771.8 13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 6757.42 Tc (MIN.) = 56.09  
 AREA-AVERAGED Fm (INCH/HR) = 0.26 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.88 EFFECTIVE AREA (ACRES) = 5424.19

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 12  
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>>>> CLEAR MEMORY BANK # 3 <<<<<  
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\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 15.1  
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>>>> DEFINE MEMORY BANK # 3 <<<<<  
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PEAK FLOWRATE TABLE FILE NAME: 0610212Y.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	461.14	33.02	0.30 ( 0.30)	1.00	342.8	21200.00
TOTAL AREA (ACRES) =			342.8			

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 11  
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>>>> CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5572.69	20.85	2.363	0.30 ( 0.28)	0.94	1572.4	30900.00



2	5576.75	20.89	2.361	0.30 ( 0.28)	0.94	1576.1	30910.00
3	5662.99	22.23	2.274	0.30 ( 0.28)	0.94	1692.2	31000.00
4	5707.66	23.02	2.223	0.30 ( 0.28)	0.94	1757.0	30800.00
5	5776.61	24.25	2.144	0.30 ( 0.28)	0.94	1864.0	30700.00
6	5829.36	26.05	2.048	0.30 ( 0.28)	0.94	2018.6	30600.00
7	6036.78	30.87	1.850	0.30 ( 0.28)	0.93	2449.8	21300.00
8	6045.78	30.99	1.847	0.30 ( 0.28)	0.93	2463.8	30520.00
9	6090.31	31.72	1.828	0.30 ( 0.28)	0.93	2544.3	30410.00
10	6121.32	32.31	1.813	0.30 ( 0.28)	0.93	2605.4	30540.00
11	6158.05	33.38	1.786	0.30 ( 0.28)	0.93	2705.6	30210.00
12	6195.26	33.60	1.780	0.30 ( 0.28)	0.93	2743.3	30510.00
13	6199.92	33.63	1.779	0.30 ( 0.28)	0.93	2748.0	30200.00
14	6336.67	34.96	1.745	0.30 ( 0.28)	0.92	2950.7	30500.00
15	6383.13	35.43	1.733	0.30 ( 0.28)	0.92	3019.2	30100.00
16	6397.72	36.07	1.717	0.30 ( 0.28)	0.92	3107.2	30400.00
17	6432.09	37.88	1.671	0.30 ( 0.27)	0.91	3345.0	30110.00
18	6505.60	40.71	1.601	0.30 ( 0.27)	0.91	3717.5	30300.00
19	6531.22	41.90	1.575	0.30 ( 0.27)	0.90	3862.3	21400.00
20	6744.75	55.59	1.338	0.30 ( 0.26)	0.88	5372.1	13210.00
21	6757.42	56.09	1.333	0.30 ( 0.26)	0.88	5424.2	13200.00
22	6743.15	57.29	1.320	0.30 ( 0.26)	0.88	5513.8	13100.00
23	6065.33	81.57	1.144	0.30 ( 0.26)	0.86	6752.0	13000.00
24	5971.55	83.89	1.129	0.30 ( 0.26)	0.86	6771.8	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.66 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	461.14	33.02	1.795	0.30 ( 0.30)	1.00	342.8	21200.00

LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 13308.00 = 11049.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5974.58	20.85	2.363	0.30 ( 0.28)	0.95	1788.8	30900.00
2	5978.93	20.89	2.361	0.30 ( 0.28)	0.95	1793.0	30910.00
3	6073.00	22.23	2.274	0.30 ( 0.28)	0.95	1923.0	31000.00
4	6121.29	23.02	2.223	0.30 ( 0.28)	0.95	1996.1	30800.00
5	6194.32	24.25	2.144	0.30 ( 0.28)	0.94	2115.8	30700.00
6	6254.91	26.05	2.048	0.30 ( 0.28)	0.94	2289.1	30600.00
7	6483.78	30.87	1.850	0.30 ( 0.28)	0.94	2770.3	21300.00
8	6493.60	30.99	1.847	0.30 ( 0.28)	0.94	2785.5	30520.00
9	6543.15	31.72	1.828	0.30 ( 0.28)	0.94	2873.6	30410.00
10	6578.01	32.31	1.813	0.30 ( 0.28)	0.94	2940.8	30540.00
11	6606.86	33.02	1.795	0.30 ( 0.28)	0.94	3014.8	21200.00
12	6616.35	33.38	1.786	0.30 ( 0.28)	0.94	3048.3	30210.00
13	6651.79	33.60	1.780	0.30 ( 0.28)	0.94	3086.1	30510.00
14	6656.23	33.63	1.779	0.30 ( 0.28)	0.94	3090.8	30200.00
15	6782.46	34.96	1.745	0.30 ( 0.28)	0.93	3293.5	30500.00
16	6825.22	35.43	1.733	0.30 ( 0.28)	0.93	3362.0	30100.00
17	6834.74	36.07	1.717	0.30 ( 0.28)	0.93	3450.0	30400.00
18	6854.88	37.88	1.671	0.30 ( 0.28)	0.92	3687.8	30110.00
19	6906.91	40.71	1.601	0.30 ( 0.27)	0.91	4060.3	30300.00
20	6924.56	41.90	1.575	0.30 ( 0.27)	0.91	4205.0	21400.00
21	7065.01	55.59	1.338	0.30 ( 0.27)	0.89	5714.9	13210.00
22	7076.00	56.09	1.333	0.30 ( 0.27)	0.89	5767.0	13200.00
23	7057.69	57.29	1.320	0.30 ( 0.27)	0.88	5856.6	13100.00
24	6325.77	81.57	1.144	0.30 ( 0.26)	0.87	7094.8	13000.00

25	6227.16	83.89	1.129	0.30 ( 0.26)	0.87	7114.6	13010.00
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TOTAL AREA (ACRES) = 7114.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 7076.00 Tc (MIN.) = 56.093  
EFFECTIVE AREA (ACRES) = 5766.97 AREA-AVERAGED Fm (INCH/HR) = 0.27  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.89  
TOTAL AREA (ACRES) = 7114.6  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.66 FEET.

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FLOW PROCESS FROM NODE 13307.00 TO NODE 13308.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

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FLOW PROCESS FROM NODE 13307.00 TO NODE 13308.00 IS CODE = 10

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

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FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<<

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FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S29.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24432.14	17.97	0.30 ( 0.30)	0.99	3795.5	50400.00
2	27926.46	26.98	0.30 ( 0.30)	0.99	6562.8	31100.00
3	31501.43	37.09	0.30 ( 0.30)	0.99	10003.8	50100.00
4	32271.27	40.79	0.30 ( 0.30)	0.99	11481.3	31810.00
5	32931.82	44.31	0.30 ( 0.30)	0.99	12945.7	31400.00
6	34287.50	52.14	0.30 ( 0.30)	0.99	16082.2	40100.00
7	36731.28	60.77	0.30 ( 0.30)	0.99	19426.5	11801.00
8	39376.32	70.24	0.30 ( 0.30)	0.99	23721.9	11530.00
9	41535.55	78.76	0.30 ( 0.30)	0.99	28705.8	11910.00
10	43564.90	85.86	0.30 ( 0.30)	0.99	33311.9	11330.00
11	44541.86	92.19	0.30 ( 0.30)	0.99	37742.3	11130.00
12	44335.97	99.78	0.30 ( 0.30)	0.99	41732.5	12330.00
13	44018.33	106.43	0.30 ( 0.30)	0.99	45075.6	12400.00
14	43401.53	115.10	0.30 ( 0.30)	0.99	48442.9	12201.00
15	42902.20	119.06	0.30 ( 0.30)	0.99	49529.2	12111.00
16	42205.20	124.43	0.30 ( 0.30)	0.99	50898.6	12101.10
17	41650.87	128.45	0.30 ( 0.30)	0.99	51749.3	10400.00
18	40069.04	136.45	0.30 ( 0.30)	0.99	53061.4	10210.00
19	38731.19	142.35	0.30 ( 0.30)	0.99	53378.0	10210.00
20	35148.69	168.41	0.30 ( 0.30)	0.99	54110.0	10100.00

TOTAL AREA (ACRES) = 54110.0

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FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 14.0

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24432.14	17.97	0.30 ( 0.30)	0.99	3795.5	50400.00
2	27926.46	26.98	0.30 ( 0.30)	0.99	6562.8	31100.00
3	31501.43	37.09	0.30 ( 0.30)	0.99	10003.8	50100.00
4	32271.27	40.79	0.30 ( 0.30)	0.99	11481.3	31810.00
5	32931.82	44.31	0.30 ( 0.30)	0.99	12945.7	31400.00
6	34287.50	52.14	0.30 ( 0.30)	0.99	16082.2	40100.00
7	36731.28	60.77	0.30 ( 0.30)	0.99	19426.5	11801.00
8	39376.32	70.24	0.30 ( 0.30)	0.99	23721.9	11530.00
9	41535.55	78.76	0.30 ( 0.30)	0.99	28705.8	11910.00
10	43564.90	85.86	0.30 ( 0.30)	0.99	33311.9	11330.00
11	44541.86	92.19	0.30 ( 0.30)	0.99	37742.3	11130.00
12	44335.97	99.78	0.30 ( 0.30)	0.99	41732.5	12330.00
13	44018.33	106.43	0.30 ( 0.30)	0.99	45075.6	12400.00
14	43401.53	115.10	0.30 ( 0.30)	0.99	48442.9	12201.00
15	42902.20	119.06	0.30 ( 0.30)	0.99	49529.2	12111.00
16	42205.20	124.43	0.30 ( 0.30)	0.99	50898.6	12101.10
17	41650.87	128.45	0.30 ( 0.30)	0.99	51749.3	10400.00
18	40069.04	136.45	0.30 ( 0.30)	0.99	53061.4	12010.00
19	38731.19	142.35	0.30 ( 0.30)	0.99	53378.0	10210.00
20	35148.69	168.41	0.30 ( 0.30)	0.99	54110.0	10100.00
TOTAL AREA (ACRES) =						54110.0

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FLOW PROCESS FROM NODE 12904.00 TO NODE 13308.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 213.00 DOWNSTREAM (FEET) = 212.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1389.52 CHANNEL SLOPE = 0.0007  
GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 19.18  
CHANNEL FLOW THRU SUBAREA (CFS) = 44541.86  
FLOW VELOCITY (FEET/SEC.) = 7.85 FLOW DEPTH (FEET) = 19.18  
TRAVEL TIME (MIN.) = 2.95 Tc (MIN.) = 95.14  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13308.00 = 118090.66 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24432.14	21.51	2.321	0.30 ( 0.30)	0.99	3795.5	50400.00
2	27926.46	30.37	1.863	0.30 ( 0.30)	0.99	6562.8	31100.00
3	31501.43	40.37	1.608	0.30 ( 0.30)	0.99	10003.8	50100.00
4	32271.27	44.04	1.529	0.30 ( 0.30)	0.99	11481.3	31810.00
5	32931.82	47.54	1.453	0.30 ( 0.30)	0.99	12945.7	31400.00
6	34287.50	55.33	1.341	0.30 ( 0.30)	0.99	16082.2	40100.00
7	36731.28	63.90	1.264	0.30 ( 0.30)	0.99	19426.5	11801.00

8	39376.32	73.30	1.200	0.30 ( 0.30)	0.99	23721.9	11530.00
9	41535.55	81.77	1.143	0.30 ( 0.30)	0.99	28705.8	11910.00
10	43564.90	88.83	1.095	0.30 ( 0.30)	0.99	33311.9	11330.00
11	44541.86	95.14	1.064	0.30 ( 0.30)	0.99	37742.3	11130.00
12	44335.97	102.73	1.029	0.30 ( 0.30)	0.99	41732.5	12330.00
13	44018.33	109.39	0.999	0.30 ( 0.30)	0.99	45075.6	12400.00
14	43401.53	118.07	0.959	0.30 ( 0.30)	0.99	48442.9	12201.00
15	42902.20	122.04	0.945	0.30 ( 0.30)	0.99	49529.2	12111.00
16	42205.20	127.43	0.931	0.30 ( 0.30)	0.99	50898.6	12101.10
17	41650.87	131.46	0.921	0.30 ( 0.30)	0.99	51749.3	10400.00
18	40069.04	139.50	0.900	0.30 ( 0.30)	0.99	53061.4	12010.00
19	38731.19	145.42	0.884	0.30 ( 0.30)	0.99	53378.0	10210.00
20	35148.69	171.57	0.816	0.30 ( 0.30)	0.99	54110.0	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 44541.86 Tc (MIN.) = 95.14

AREA-AVERAGED Fm (INCH/HR) = 0.30 AREA-AVERAGED Fp (INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA (ACRES) = 37742.30

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FLOW PROCESS FROM NODE 13307.00 TO NODE 13308.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24432.14	21.51	2.321	0.30 ( 0.30)	0.99	3795.5	50400.00
2	27926.46	30.37	1.863	0.30 ( 0.30)	0.99	6562.8	31100.00
3	31501.43	40.37	1.608	0.30 ( 0.30)	0.99	10003.8	50100.00
4	32271.27	44.04	1.529	0.30 ( 0.30)	0.99	11481.3	31810.00
5	32931.82	47.54	1.453	0.30 ( 0.30)	0.99	12945.7	31400.00
6	34287.50	55.33	1.341	0.30 ( 0.30)	0.99	16082.2	40100.00
7	36731.28	63.90	1.264	0.30 ( 0.30)	0.99	19426.5	11801.00
8	39376.32	73.30	1.200	0.30 ( 0.30)	0.99	23721.9	11530.00
9	41535.55	81.77	1.143	0.30 ( 0.30)	0.99	28705.8	11910.00
10	43564.90	88.83	1.095	0.30 ( 0.30)	0.99	33311.9	11330.00
11	44541.86	95.14	1.064	0.30 ( 0.30)	0.99	37742.3	11130.00
12	44335.97	102.73	1.029	0.30 ( 0.30)	0.99	41732.5	12330.00
13	44018.33	109.39	0.999	0.30 ( 0.30)	0.99	45075.6	12400.00
14	43401.53	118.07	0.959	0.30 ( 0.30)	0.99	48442.9	12201.00
15	42902.20	122.04	0.945	0.30 ( 0.30)	0.99	49529.2	12111.00
16	42205.20	127.43	0.931	0.30 ( 0.30)	0.99	50898.6	12101.10
17	41650.87	131.46	0.921	0.30 ( 0.30)	0.99	51749.3	10400.00
18	40069.04	139.50	0.900	0.30 ( 0.30)	0.99	53061.4	12010.00
19	38731.19	145.42	0.884	0.30 ( 0.30)	0.99	53378.0	10210.00
20	35148.69	171.57	0.816	0.30 ( 0.30)	0.99	54110.0	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13308.00 = 118090.66 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5974.58	20.85	2.363	0.30 ( 0.28)	0.95	1788.8	30900.00
2	5978.93	20.89	2.361	0.30 ( 0.28)	0.95	1793.0	30910.00
3	6073.00	22.23	2.274	0.30 ( 0.28)	0.95	1923.0	31000.00
4	6121.29	23.02	2.223	0.30 ( 0.28)	0.95	1996.1	30800.00
5	6194.32	24.25	2.144	0.30 ( 0.28)	0.94	2115.8	30700.00
6	6254.91	26.05	2.048	0.30 ( 0.28)	0.94	2289.1	30600.00

7	6483.78	30.87	1.850	0.30	(0.28)	0.94	2770.3	21300.00
8	6493.60	30.99	1.847	0.30	(0.28)	0.94	2785.5	30520.00
9	6543.15	31.72	1.828	0.30	(0.28)	0.94	2873.6	30410.00
10	6578.01	32.31	1.813	0.30	(0.28)	0.94	2940.8	30540.00
11	6606.86	33.02	1.795	0.30	(0.28)	0.94	3014.8	21200.00
12	6616.35	33.38	1.786	0.30	(0.28)	0.94	3048.3	30210.00
13	6651.79	33.60	1.780	0.30	(0.28)	0.94	3086.1	30510.00
14	6656.23	33.63	1.779	0.30	(0.28)	0.94	3090.8	30200.00
15	6782.46	34.96	1.745	0.30	(0.28)	0.93	3293.5	30500.00
16	6825.22	35.43	1.733	0.30	(0.28)	0.93	3362.0	30100.00
17	6834.74	36.07	1.717	0.30	(0.28)	0.93	3450.0	30400.00
18	6854.88	37.88	1.671	0.30	(0.28)	0.92	3687.8	30110.00
19	6906.91	40.71	1.601	0.30	(0.27)	0.91	4060.3	30300.00
20	6924.56	41.90	1.575	0.30	(0.27)	0.91	4205.0	21400.00
21	7065.01	55.59	1.338	0.30	(0.27)	0.89	5714.9	13210.00
22	7076.00	56.09	1.333	0.30	(0.27)	0.89	5767.0	13200.00
23	7057.69	57.29	1.320	0.30	(0.27)	0.88	5856.6	13100.00
24	6325.77	81.57	1.144	0.30	(0.26)	0.87	7094.8	13000.00
25	6227.16	83.89	1.129	0.30	(0.26)	0.87	7114.6	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.66 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE	
1	30155.23	20.85	2.363	0.30	(0.29)	0.97	5467.7	30900.00
2	30176.65	20.89	2.361	0.30	(0.29)	0.97	5479.4	30910.00
3	30454.36	21.51	2.321	0.30	(0.29)	0.97	5648.3	50400.00
4	30790.98	22.23	2.274	0.30	(0.29)	0.97	5944.9	31000.00
5	31151.96	23.02	2.223	0.30	(0.29)	0.97	6265.6	30800.00
6	31707.18	24.25	2.144	0.30	(0.29)	0.97	6767.1	30700.00
7	32479.48	26.05	2.048	0.30	(0.29)	0.97	7504.1	30600.00
8	34386.43	30.37	1.863	0.30	(0.29)	0.97	9283.1	31100.00
9	34589.55	30.87	1.850	0.30	(0.29)	0.97	9505.7	21300.00
10	34641.07	30.99	1.847	0.30	(0.29)	0.97	9561.1	30520.00
11	34951.56	31.72	1.828	0.30	(0.29)	0.97	9900.3	30410.00
12	35196.87	32.31	1.813	0.30	(0.29)	0.97	10170.1	30540.00
13	35480.34	33.02	1.795	0.30	(0.29)	0.97	10489.1	21200.00
14	35618.38	33.38	1.786	0.30	(0.29)	0.97	10646.4	30210.00
15	35733.95	33.60	1.780	0.30	(0.29)	0.97	10761.3	30510.00
16	35748.44	33.63	1.779	0.30	(0.29)	0.97	10775.6	30200.00
17	36351.45	34.96	1.745	0.30	(0.29)	0.97	11437.3	30500.00
18	36561.69	35.43	1.733	0.30	(0.29)	0.97	11666.9	30100.00
19	36801.27	36.07	1.717	0.30	(0.29)	0.97	11976.4	30400.00
20	37465.95	37.88	1.671	0.30	(0.29)	0.97	12834.6	30110.00
21	38402.09	40.37	1.608	0.30	(0.29)	0.97	14019.3	50100.00
22	38479.62	40.71	1.601	0.30	(0.29)	0.97	14200.9	30300.00
23	38747.30	41.90	1.575	0.30	(0.29)	0.97	14825.5	21400.00
24	39217.78	44.04	1.529	0.30	(0.29)	0.97	15922.3	31810.00
25	39914.26	47.54	1.453	0.30	(0.29)	0.97	17772.9	31400.00
26	41349.82	55.33	1.341	0.30	(0.29)	0.96	21768.0	40100.00
27	41427.66	55.59	1.338	0.30	(0.29)	0.96	21899.9	13210.00
28	41580.90	56.09	1.333	0.30	(0.29)	0.96	22146.7	13200.00
29	41903.26	57.29	1.320	0.30	(0.29)	0.96	22702.6	13100.00
30	43589.74	63.90	1.264	0.30	(0.29)	0.96	25620.2	11801.00
31	45951.16	73.30	1.200	0.30	(0.29)	0.97	30395.4	11530.00
32	47809.46	81.57	1.144	0.30	(0.29)	0.97	35680.8	13000.00
33	47852.69	81.77	1.143	0.30	(0.29)	0.97	35802.2	11910.00
34	48371.71	83.89	1.129	0.30	(0.29)	0.97	37202.7	13010.00

35	49552.50	88.83	1.095	0.30	(0.29)	0.97	40426.5	11330.00
36	50304.49	95.14	1.064	0.30	(0.29)	0.97	44856.9	11130.00
37	49850.15	102.73	1.029	0.30	(0.29)	0.97	48847.1	12330.00
38	49314.72	109.39	0.999	0.30	(0.29)	0.98	52190.2	12400.00
39	48413.73	118.07	0.959	0.30	(0.29)	0.98	55557.5	12201.00
40	47813.02	122.04	0.945	0.30	(0.29)	0.98	56643.8	12111.00
41	47015.43	127.43	0.931	0.30	(0.29)	0.98	58013.2	12101.10
42	46385.73	131.46	0.921	0.30	(0.29)	0.98	58863.9	10400.00
43	44653.75	139.50	0.900	0.30	(0.29)	0.98	60176.0	12010.00
44	43205.19	145.42	0.884	0.30	(0.29)	0.98	60492.6	10210.00
45	39134.10	171.57	0.816	0.30	(0.29)	0.98	61224.6	10100.00

TOTAL AREA (ACRES) = 61224.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 50304.49 Tc (MIN.) = 95.145  
EFFECTIVE AREA (ACRES) = 44856.91 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA (ACRES) = 61224.6  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13308.00 = 118090.66 FEET.

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 61224.6 TC (MIN.) = 95.14  
EFFECTIVE AREA (ACRES) = 44856.91 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.973  
PEAK FLOW RATE (CFS) = 50304.49

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE	
1	30155.23	20.85	2.363	0.30	(0.29)	0.97	5467.7	30900.00
2	30176.65	20.89	2.361	0.30	(0.29)	0.97	5479.4	30910.00
3	30454.36	21.51	2.321	0.30	(0.29)	0.97	5648.3	50400.00
4	30790.98	22.23	2.274	0.30	(0.29)	0.97	5944.9	31000.00
5	31151.96	23.02	2.223	0.30	(0.29)	0.97	6265.6	30800.00
6	31707.18	24.25	2.144	0.30	(0.29)	0.97	6767.1	30700.00
7	32479.48	26.05	2.048	0.30	(0.29)	0.97	7504.1	30600.00
8	34386.43	30.37	1.863	0.30	(0.29)	0.97	9283.1	31100.00
9	34589.55	30.87	1.850	0.30	(0.29)	0.97	9505.7	21300.00
10	34641.07	30.99	1.847	0.30	(0.29)	0.97	9561.1	30520.00
11	34951.56	31.72	1.828	0.30	(0.29)	0.97	9900.3	30410.00
12	35196.87	32.31	1.813	0.30	(0.29)	0.97	10170.1	30540.00
13	35480.34	33.02	1.795	0.30	(0.29)	0.97	10489.1	21200.00
14	35618.38	33.38	1.786	0.30	(0.29)	0.97	10646.4	30210.00
15	35733.95	33.60	1.780	0.30	(0.29)	0.97	10761.3	30510.00
16	35748.44	33.63	1.779	0.30	(0.29)	0.97	10775.6	30200.00
17	36351.45	34.96	1.745	0.30	(0.29)	0.97	11437.3	30500.00
18	36561.69	35.43	1.733	0.30	(0.29)	0.97	11666.9	30100.00
19	36801.27	36.07	1.717	0.30	(0.29)	0.97	11976.4	30400.00
20	37465.95	37.88	1.671	0.30	(0.29)	0.97	12834.6	30110.00
21	38402.09	40.37	1.608	0.30	(0.29)	0.97	14019.3	50100.00
22	38479.62	40.71	1.601	0.30	(0.29)	0.97	14200.9	30300.00
23	38747.30	41.90	1.575	0.30	(0.29)	0.97	14825.5	21400.00
24	39217.78	44.04	1.529	0.30	(0.29)	0.97	15922.3	31810.00
25	39914.26	47.54	1.453	0.30	(0.29)	0.97	17772.9	31400.00
26	41349.82	55.33	1.341	0.30	(0.29)	0.96	21768.0	40100.00
27	41427.66	55.59	1.338	0.30	(0.29)	0.96	21899.9	13210.00
28	41580.90	56.09	1.333	0.30	(0.29)	0.96	22146.7	13200.00
29	41903.26	57.29	1.320	0.30	(0.29)	0.96	22702.6	13100.00

30	43589.74	63.90	1.264	0.30 ( 0.29)	0.96	25620.2	11801.00
31	45951.16	73.30	1.200	0.30 ( 0.29)	0.97	30395.4	11530.00
32	47809.46	81.57	1.144	0.30 ( 0.29)	0.97	35680.8	13000.00
33	47852.69	81.77	1.143	0.30 ( 0.29)	0.97	35802.2	11910.00
34	48371.71	83.89	1.129	0.30 ( 0.29)	0.97	37202.7	13010.00
35	49552.50	88.83	1.095	0.30 ( 0.29)	0.97	40426.5	11330.00
36	50304.49	95.14	1.064	0.30 ( 0.29)	0.97	44856.9	11130.00
37	49850.15	102.73	1.029	0.30 ( 0.29)	0.97	48847.1	12330.00
38	49314.72	109.39	0.999	0.30 ( 0.29)	0.98	52190.2	12400.00
39	48413.73	118.07	0.959	0.30 ( 0.29)	0.98	55557.5	12201.00
40	47813.02	122.04	0.945	0.30 ( 0.29)	0.98	56643.8	12111.00
41	47015.43	127.43	0.931	0.30 ( 0.29)	0.98	58013.2	12101.10
42	46385.73	131.46	0.921	0.30 ( 0.29)	0.98	58863.9	10400.00
43	44653.75	139.50	0.900	0.30 ( 0.29)	0.98	60176.0	12010.00
44	43205.19	145.42	0.884	0.30 ( 0.29)	0.98	60492.6	10210.00
45	39134.10	171.57	0.816	0.30 ( 0.29)	0.98	61224.6	10100.00

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END OF RATIONAL METHOD ANALYSIS

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

Michael Baker International  
5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

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FILE NAME: S34.DAT  
TIME/DATE OF STUDY: 08:15 07/16/2018  
=====

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--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.851
- 2) 10.00; 3.777
- 3) 15.00; 2.925
- 4) 20.00; 2.414
- 5) 25.00; 2.092
- 6) 30.00; 1.869
- 7) 40.00; 1.614
- 8) 50.00; 1.398
- 9) 60.00; 1.287
- 10) 90.00; 1.084
- 11) 120.00; 0.947
- 12) 180.00; 0.791
- 13) 360.00; 0.585
- 14) 1200.00; 0.255

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN CROSSFALL (FT)	STREET / SIDE / WAY	CROSSFALL (FT)	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	STREET GEOMETRIES (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

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FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<<  
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PEAK FLOWRATE TABLE FILE NAME: S33.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	32479.48	26.05	0.30 ( 0.29)	0.97	7504.1	30600.00
2	35748.44	33.63	0.30 ( 0.29)	0.97	10775.6	30200.00
3	37465.95	37.88	0.30 ( 0.29)	0.97	12834.6	30110.00
4	39217.78	44.04	0.30 ( 0.29)	0.97	15922.3	31810.00
5	39914.26	47.54	0.30 ( 0.29)	0.97	17772.9	31400.00
6	41903.26	57.29	0.30 ( 0.29)	0.96	22702.6	13100.00
7	43589.74	63.90	0.30 ( 0.29)	0.96	25620.2	11801.00
8	45951.16	73.30	0.30 ( 0.29)	0.97	30395.4	11530.00
9	48371.71	83.89	0.30 ( 0.29)	0.97	37202.7	13010.00
10	49552.50	88.83	0.30 ( 0.29)	0.97	40426.5	11330.00
11	50304.49	95.14	0.30 ( 0.29)	0.97	44856.9	11130.00
12	49850.15	102.73	0.30 ( 0.29)	0.97	48847.1	12330.00
13	49314.72	109.39	0.30 ( 0.29)	0.98	52190.2	12400.00
14	48413.73	118.07	0.30 ( 0.29)	0.98	55557.5	12201.00
15	47813.02	122.04	0.30 ( 0.29)	0.98	56643.8	12111.00
16	47015.43	127.43	0.30 ( 0.29)	0.98	58013.2	12101.10
17	46385.73	131.46	0.30 ( 0.29)	0.98	58863.9	10400.00
18	44653.75	139.50	0.30 ( 0.29)	0.98	60176.0	12010.00
19	43205.19	145.42	0.30 ( 0.29)	0.98	60492.6	10210.00
20	39134.10	171.57	0.30 ( 0.29)	0.98	61224.6	10100.00

TOTAL AREA (ACRES) = 61224.6

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FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 14.0  
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>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
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MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	32479.48	26.05	0.30 ( 0.29)	0.97	7504.1	30600.00
2	35748.44	33.63	0.30 ( 0.29)	0.97	10775.6	30200.00
3	37465.95	37.88	0.30 ( 0.29)	0.97	12834.6	30110.00
4	39217.78	44.04	0.30 ( 0.29)	0.97	15922.3	31810.00
5	39914.26	47.54	0.30 ( 0.29)	0.97	17772.9	31400.00
6	41903.26	57.29	0.30 ( 0.29)	0.96	22702.6	13100.00
7	43589.74	63.90	0.30 ( 0.29)	0.96	25620.2	11801.00
8	45951.16	73.30	0.30 ( 0.29)	0.97	30395.4	11530.00
9	48371.71	83.89	0.30 ( 0.29)	0.97	37202.7	13010.00
10	49552.50	88.83	0.30 ( 0.29)	0.97	40426.5	11330.00
11	50304.49	95.14	0.30 ( 0.29)	0.97	44856.9	11130.00
12	49850.15	102.73	0.30 ( 0.29)	0.97	48847.1	12330.00
13	49314.72	109.39	0.30 ( 0.29)	0.98	52190.2	12400.00
14	48413.73	118.07	0.30 ( 0.29)	0.98	55557.5	12201.00
15	47813.02	122.04	0.30 ( 0.29)	0.98	56643.8	12111.00
16	47015.43	127.43	0.30 ( 0.29)	0.98	58013.2	12101.10
17	46385.73	131.46	0.30 ( 0.29)	0.98	58863.9	10400.00
18	44653.75	139.50	0.30 ( 0.29)	0.98	60176.0	12010.00

19 43205.19 145.42 0.30( 0.29) 0.98 60492.6 10210.00  
20 39134.10 171.57 0.30( 0.29) 0.98 61224.6 10100.00  
TOTAL AREA (ACRES) = 61224.6

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13308.00 TO NODE 13402.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 212.00 DOWNSTREAM(FEET) = 209.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 623.02 CHANNEL SLOPE = 0.0048  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 12.22  
CHANNEL FLOW THRU SUBAREA(CFS) = 50304.49  
FLOW VELOCITY(FEET/SEC.) = 15.77 FLOW DEPTH(FEET) = 12.22  
TRAVEL TIME(MIN.) = 0.66 Tc(MIN.) = 95.80  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13402.00 = 118713.68 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	32479.48	26.81	2.011	0.30( 0.29)	0.97	7504.1	30600.00
2	35748.44	34.36	1.758	0.30( 0.29)	0.97	10775.6	30200.00
3	37465.95	38.60	1.650	0.30( 0.29)	0.97	12834.6	30110.00
4	39217.78	44.75	1.511	0.30( 0.29)	0.97	15922.3	31810.00
5	39914.26	48.25	1.436	0.30( 0.29)	0.97	17772.9	31400.00
6	41903.26	57.98	1.309	0.30( 0.29)	0.96	22702.6	13100.00
7	43589.74	64.58	1.256	0.30( 0.29)	0.96	25620.2	11801.00
8	45951.16	73.98	1.192	0.30( 0.29)	0.97	30395.4	11530.00
9	48371.71	84.56	1.121	0.30( 0.29)	0.97	37202.7	13010.00
10	49552.50	89.49	1.087	0.30( 0.29)	0.97	40426.5	11330.00
11	50304.49	95.80	1.057	0.30( 0.29)	0.97	44856.9	11130.00
12	49850.15	103.39	1.023	0.30( 0.29)	0.97	48847.1	12330.00
13	49314.72	110.05	0.992	0.30( 0.29)	0.98	52190.2	12400.00
14	48413.73	118.74	0.953	0.30( 0.29)	0.98	55557.5	12201.00
15	47813.02	122.71	0.940	0.30( 0.29)	0.98	56643.8	12111.00
16	47015.43	128.10	0.926	0.30( 0.29)	0.98	58013.2	12101.10
17	46385.73	132.14	0.915	0.30( 0.29)	0.98	58863.9	10400.00
18	44653.75	140.18	0.895	0.30( 0.29)	0.98	60176.0	12010.00
19	43205.19	146.11	0.879	0.30( 0.29)	0.98	60492.6	10210.00
20	39134.10	172.29	0.811	0.30( 0.29)	0.98	61224.6	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 50304.49 Tc(MIN.) = 95.80  
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 44856.91

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13402.00 TO NODE 13402.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 2 <<<<<

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PEAK FLOWRATE TABLE FILE NAME: 0610505Y.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	299.75	19.45	0.30( 0.30)	0.99	153.2	50500.00

TOTAL AREA(ACRES) = 153.2

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13402.00 TO NODE 13402.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	32479.48	26.81	2.011	0.30( 0.29)	0.97	7504.1	30600.00
2	35748.44	34.36	1.758	0.30( 0.29)	0.97	10775.6	30200.00
3	37465.95	38.60	1.650	0.30( 0.29)	0.97	12834.6	30110.00
4	39217.78	44.75	1.511	0.30( 0.29)	0.97	15922.3	31810.00
5	39914.26	48.25	1.436	0.30( 0.29)	0.97	17772.9	31400.00
6	41903.26	57.98	1.309	0.30( 0.29)	0.96	22702.6	13100.00
7	43589.74	64.58	1.256	0.30( 0.29)	0.96	25620.2	11801.00
8	45951.16	73.98	1.192	0.30( 0.29)	0.97	30395.4	11530.00
9	48371.71	84.56	1.121	0.30( 0.29)	0.97	37202.7	13010.00
10	49552.50	89.49	1.087	0.30( 0.29)	0.97	40426.5	11330.00
11	50304.49	95.80	1.057	0.30( 0.29)	0.97	44856.9	11130.00
12	49850.15	103.39	1.023	0.30( 0.29)	0.97	48847.1	12330.00
13	49314.72	110.05	0.992	0.30( 0.29)	0.98	52190.2	12400.00
14	48413.73	118.74	0.953	0.30( 0.29)	0.98	55557.5	12201.00
15	47813.02	122.71	0.940	0.30( 0.29)	0.98	56643.8	12111.00
16	47015.43	128.10	0.926	0.30( 0.29)	0.98	58013.2	12101.10
17	46385.73	132.14	0.915	0.30( 0.29)	0.98	58863.9	10400.00
18	44653.75	140.18	0.895	0.30( 0.29)	0.98	60176.0	12010.00
19	43205.19	146.11	0.879	0.30( 0.29)	0.98	60492.6	10210.00
20	39134.10	172.29	0.811	0.30( 0.29)	0.98	61224.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13402.00 = 118713.68 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	299.75	19.45	2.470	0.30( 0.30)	0.99	153.2	50500.00

LONGEST FLOWPATH FROM NODE 50500.00 TO NODE 13402.00 = 6247.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	30152.10	19.45	2.470	0.30( 0.29)	0.97	5596.4	50500.00
2	32715.93	26.81	2.011	0.30( 0.29)	0.97	7657.3	30600.00
3	35949.95	34.36	1.758	0.30( 0.29)	0.97	10928.8	30200.00
4	37652.57	38.60	1.650	0.30( 0.29)	0.97	12987.7	30110.00
5	39385.33	44.75	1.511	0.30( 0.29)	0.97	16075.4	31810.00
6	40071.39	48.25	1.436	0.30( 0.29)	0.97	17926.1	31400.00
7	42042.96	57.98	1.309	0.30( 0.29)	0.96	22855.7	13100.00
8	43722.09	64.58	1.256	0.30( 0.29)	0.96	25773.4	11801.00
9	46074.74	73.98	1.192	0.30( 0.29)	0.97	30548.6	11530.00
10	48485.43	84.56	1.121	0.30( 0.29)	0.97	37355.8	13010.00
11	49661.61	89.49	1.087	0.30( 0.29)	0.97	40579.7	11330.00
12	50409.48	95.80	1.057	0.30( 0.29)	0.97	45010.1	11130.00
13	49950.36	103.39	1.023	0.30( 0.29)	0.97	49000.3	12330.00
14	49410.74	110.05	0.992	0.30( 0.29)	0.98	52343.4	12400.00
15	48504.29	118.74	0.953	0.30( 0.29)	0.98	55710.7	12201.00
16	47901.80	122.71	0.940	0.30( 0.29)	0.98	56797.0	12111.00

17	47102.29	128.10	0.926	0.30	( 0.29)	0.98	58166.4	12101.10
18	46471.13	132.14	0.915	0.30	( 0.29)	0.98	59017.1	10400.00
19	44736.27	140.18	0.895	0.30	( 0.29)	0.98	60329.2	12010.00
20	43285.59	146.11	0.879	0.30	( 0.29)	0.98	60645.8	10210.00
21	39205.12	172.29	0.811	0.30	( 0.29)	0.98	61377.8	10100.00

TOTAL AREA (ACRES) = 61377.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 50409.48 Tc (MIN.) = 95.803  
EFFECTIVE AREA (ACRES) = 45010.09 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA (ACRES) = 61377.8  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13402.00 = 118713.68 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13402.00 TO NODE 13404.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
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ELEVATION DATA: UPSTREAM (FEET) = 209.00 DOWNSTREAM (FEET) = 207.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 395.35 CHANNEL SLOPE = 0.0051  
GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 12.06  
CHANNEL FLOW THRU SUBAREA (CFS) = 50409.48  
FLOW VELOCITY (FEET/SEC.) = 16.05 FLOW DEPTH (FEET) = 12.06  
TRAVEL TIME (MIN.) = 0.41 Tc (MIN.) = 96.21  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13404.00 = 119109.03 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	30152.10	19.93	2.421	0.30 ( 0.29)	0.97	5596.4	50500.00
2	32715.93	27.28	1.990	0.30 ( 0.29)	0.97	7657.3	30600.00
3	35949.95	34.82	1.746	0.30 ( 0.29)	0.97	10928.8	30200.00
4	37652.57	39.05	1.638	0.30 ( 0.29)	0.97	12987.7	30110.00
5	39385.33	45.20	1.502	0.30 ( 0.29)	0.97	16075.4	31810.00
6	40071.39	48.69	1.426	0.30 ( 0.29)	0.97	17926.1	31400.00
7	42042.96	58.42	1.305	0.30 ( 0.29)	0.96	22855.7	13100.00
8	43722.09	65.01	1.253	0.30 ( 0.29)	0.96	25773.4	11801.00
9	46074.74	74.40	1.190	0.30 ( 0.29)	0.97	30548.6	11530.00
10	48485.43	84.97	1.118	0.30 ( 0.29)	0.97	37355.8	13010.00
11	49661.61	89.91	1.085	0.30 ( 0.29)	0.97	40579.7	11330.00
12	50409.48	96.21	1.056	0.30 ( 0.29)	0.97	45010.1	11130.00
13	49950.36	103.81	1.021	0.30 ( 0.29)	0.97	49000.3	12330.00
14	49410.74	110.46	0.991	0.30 ( 0.29)	0.98	52343.4	12400.00
15	48504.29	119.15	0.951	0.30 ( 0.29)	0.98	55710.7	12201.00
16	47901.80	123.13	0.939	0.30 ( 0.29)	0.98	56797.0	12111.00
17	47102.29	128.52	0.925	0.30 ( 0.29)	0.98	58166.4	12101.10
18	46471.13	132.56	0.914	0.30 ( 0.29)	0.98	59017.1	10400.00
19	44736.27	140.61	0.893	0.30 ( 0.29)	0.98	60329.2	12010.00
20	43285.59	146.54	0.878	0.30 ( 0.29)	0.98	60645.8	10210.00
21	39205.12	172.73	0.810	0.30 ( 0.29)	0.98	61377.8	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 50409.48 Tc (MIN.) = 96.21  
AREA-AVERAGED Fm (INCH/HR) = 0.29 AREA-AVERAGED Fp (INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA (ACRES) = 45010.09

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13404.00 TO NODE 13404.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<  
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PEAK FLOWRATE TABLE FILE NAME: 0610506Y.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	107.09	17.21	0.30 ( 0.30)	1.00	49.6	50600.00

TOTAL AREA (ACRES) = 49.6

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13404.00 TO NODE 13404.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	30152.10	19.93	2.421	0.30 ( 0.29)	0.97	5596.4	50500.00
2	32715.93	27.28	1.990	0.30 ( 0.29)	0.97	7657.3	30600.00
3	35949.95	34.82	1.746	0.30 ( 0.29)	0.97	10928.8	30200.00
4	37652.57	39.05	1.638	0.30 ( 0.29)	0.97	12987.7	30110.00
5	39385.33	45.20	1.502	0.30 ( 0.29)	0.97	16075.4	31810.00
6	40071.39	48.69	1.426	0.30 ( 0.29)	0.97	17926.1	31400.00
7	42042.96	58.42	1.305	0.30 ( 0.29)	0.96	22855.7	13100.00
8	43722.09	65.01	1.253	0.30 ( 0.29)	0.96	25773.4	11801.00
9	46074.74	74.40	1.190	0.30 ( 0.29)	0.97	30548.6	11530.00
10	48485.43	84.97	1.118	0.30 ( 0.29)	0.97	37355.8	13010.00
11	49661.61	89.91	1.085	0.30 ( 0.29)	0.97	40579.7	11330.00
12	50409.48	96.21	1.056	0.30 ( 0.29)	0.97	45010.1	11130.00
13	49950.36	103.81	1.021	0.30 ( 0.29)	0.97	49000.3	12330.00
14	49410.74	110.46	0.991	0.30 ( 0.29)	0.98	52343.4	12400.00
15	48504.29	119.15	0.951	0.30 ( 0.29)	0.98	55710.7	12201.00
16	47901.80	123.13	0.939	0.30 ( 0.29)	0.98	56797.0	12111.00
17	47102.29	128.52	0.925	0.30 ( 0.29)	0.98	58166.4	12101.10
18	46471.13	132.56	0.914	0.30 ( 0.29)	0.98	59017.1	10400.00
19	44736.27	140.61	0.893	0.30 ( 0.29)	0.98	60329.2	12010.00
20	43285.59	146.54	0.878	0.30 ( 0.29)	0.98	60645.8	10210.00
21	39205.12	172.73	0.810	0.30 ( 0.29)	0.98	61377.8	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13404.00 = 119109.03 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	107.09	17.21	2.699	0.30 ( 0.30)	1.00	49.6	50600.00

LONGEST FLOWPATH FROM NODE 50600.00 TO NODE 13404.00 = 4378.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	29542.17	17.21	2.699	0.30 ( 0.29)	0.97	4880.8	50600.00
2	30246.76	19.93	2.421	0.30 ( 0.29)	0.97	5646.0	50500.00
3	32791.37	27.28	1.990	0.30 ( 0.29)	0.97	7706.8	30600.00
4	36014.49	34.82	1.746	0.30 ( 0.29)	0.97	10978.4	30200.00

5	37712.30	39.05	1.638	0.30	( 0.29)	0.97	13037.3	30110.00
6	39438.97	45.20	1.502	0.30	( 0.29)	0.97	16125.0	31810.00
7	40121.66	48.69	1.426	0.30	( 0.29)	0.97	17975.7	31400.00
8	42087.80	58.42	1.305	0.30	( 0.29)	0.96	22905.3	13100.00
9	43764.63	65.01	1.253	0.30	( 0.29)	0.96	25822.9	11801.00
10	46114.45	74.40	1.190	0.30	( 0.29)	0.97	30598.1	11530.00
11	48521.94	84.97	1.118	0.30	( 0.29)	0.97	37405.4	13010.00
12	49696.63	89.91	1.085	0.30	( 0.29)	0.97	40629.3	11330.00
13	50443.21	96.21	1.056	0.30	( 0.29)	0.97	45059.7	11130.00
14	49982.54	103.81	1.021	0.30	( 0.29)	0.97	49049.9	12330.00
15	49441.56	110.46	0.991	0.30	( 0.29)	0.98	52393.0	12400.00
16	48533.34	119.15	0.951	0.30	( 0.29)	0.98	55760.3	12201.00
17	47930.32	123.13	0.939	0.30	( 0.29)	0.98	56846.6	12111.00
18	47130.18	128.52	0.925	0.30	( 0.29)	0.98	58216.0	12101.10
19	46498.55	132.56	0.914	0.30	( 0.29)	0.98	59066.7	10400.00
20	44762.76	140.61	0.893	0.30	( 0.29)	0.98	60378.8	12010.00
21	43311.39	146.54	0.878	0.30	( 0.29)	0.98	60695.4	10210.00
22	39227.88	172.73	0.810	0.30	( 0.29)	0.98	61427.4	10100.00

TOTAL AREA (ACRES) = 61427.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 50443.21 Tc(MIN.) = 96.214  
EFFECTIVE AREA(ACRES) = 45059.68 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA (ACRES) = 61427.4  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13404.00 = 119109.03 FEET.

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FLOW PROCESS FROM NODE 13404.00 TO NODE 13406.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 207.00 DOWNSTREAM(FEET) = 195.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1601.97 CHANNEL SLOPE = 0.0075  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.82  
CHANNEL FLOW THRU SUBAREA(CFS) = 50443.21  
FLOW VELOCITY(FEET/SEC.) = 18.36 FLOW DEPTH(FEET) = 10.82  
TRAVEL TIME(MIN.) = 1.45 Tc(MIN.) = 97.67  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13406.00 = 120711.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	29542.17	18.94	2.522	0.30 ( 0.29)	0.97	4880.8	50600.00
2	30246.76	21.65	2.308	0.30 ( 0.29)	0.97	5646.0	50500.00
3	32791.37	28.96	1.916	0.30 ( 0.29)	0.97	7706.8	30600.00
4	36014.49	36.44	1.705	0.30 ( 0.29)	0.97	10978.4	30200.00
5	37712.30	40.65	1.600	0.30 ( 0.29)	0.97	13037.3	30110.00
6	39438.97	46.77	1.468	0.30 ( 0.29)	0.97	16125.0	31810.00
7	40121.66	50.26	1.395	0.30 ( 0.29)	0.97	17975.7	31400.00
8	42087.80	59.96	1.287	0.30 ( 0.29)	0.96	22905.3	13100.00
9	43764.63	66.54	1.243	0.30 ( 0.29)	0.96	25822.9	11801.00
10	46114.45	75.90	1.179	0.30 ( 0.29)	0.97	30598.1	11530.00
11	48521.94	86.44	1.108	0.30 ( 0.29)	0.97	37405.4	13010.00
12	49696.63	91.37	1.078	0.30 ( 0.29)	0.97	40629.3	11330.00

13	50443.21	97.67	1.049	0.30	( 0.29)	0.97	45059.7	11130.00
14	49982.54	105.27	1.014	0.30	( 0.29)	0.97	49049.9	12330.00
15	49441.56	111.93	0.984	0.30	( 0.29)	0.98	52393.0	12400.00
16	48533.34	120.62	0.945	0.30	( 0.29)	0.98	55760.3	12201.00
17	47930.32	124.61	0.935	0.30	( 0.29)	0.98	56846.6	12111.00
18	47130.18	130.01	0.921	0.30	( 0.29)	0.98	58216.0	12101.10
19	46498.55	134.05	0.910	0.30	( 0.29)	0.98	59066.7	10400.00
20	44762.76	142.12	0.889	0.30	( 0.29)	0.98	60378.8	12010.00
21	43311.39	148.07	0.874	0.30	( 0.29)	0.98	60695.4	10210.00
22	39227.88	174.31	0.806	0.30	( 0.29)	0.98	61427.4	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 50443.21 Tc(MIN.) = 97.67  
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 45059.68

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13406.00 TO NODE 13406.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13406.00 TO NODE 13406.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610211Y.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	236.24	12.70	0.30 ( 0.30)	1.00	87.0	21100.00

TOTAL AREA (ACRES) = 87.0

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13406.00 TO NODE 13406.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	29542.17	18.94	2.522	0.30 ( 0.29)	0.97	4880.8	50600.00
2	30246.76	21.65	2.308	0.30 ( 0.29)	0.97	5646.0	50500.00
3	32791.37	28.96	1.916	0.30 ( 0.29)	0.97	7706.8	30600.00
4	36014.49	36.44	1.705	0.30 ( 0.29)	0.97	10978.4	30200.00
5	37712.30	40.65	1.600	0.30 ( 0.29)	0.97	13037.3	30110.00
6	39438.97	46.77	1.468	0.30 ( 0.29)	0.97	16125.0	31810.00
7	40121.66	50.26	1.395	0.30 ( 0.29)	0.97	17975.7	31400.00
8	42087.80	59.96	1.287	0.30 ( 0.29)	0.96	22905.3	13100.00
9	43764.63	66.54	1.243	0.30 ( 0.29)	0.96	25822.9	11801.00
10	46114.45	75.90	1.179	0.30 ( 0.29)	0.97	30598.1	11530.00
11	48521.94	86.44	1.108	0.30 ( 0.29)	0.97	37405.4	13010.00
12	49696.63	91.37	1.078	0.30 ( 0.29)	0.97	40629.3	11330.00
13	50443.21	97.67	1.049	0.30 ( 0.29)	0.97	45059.7	11130.00
14	49982.54	105.27	1.014	0.30 ( 0.29)	0.97	49049.9	12330.00
15	49441.56	111.93	0.984	0.30 ( 0.29)	0.98	52393.0	12400.00
16	48533.34	120.62	0.945	0.30 ( 0.29)	0.98	55760.3	12201.00



17	47930.32	124.61	0.935	0.30( 0.29)	0.98	56846.6	12111.00
18	47130.18	130.01	0.921	0.30( 0.29)	0.98	58216.0	12101.10
19	46498.55	134.05	0.910	0.30( 0.29)	0.98	59066.7	10400.00
20	44762.76	142.12	0.889	0.30( 0.29)	0.98	60378.8	12010.00
21	43311.39	148.07	0.874	0.30( 0.29)	0.98	60695.4	10210.00
22	39227.88	174.31	0.806	0.30( 0.29)	0.98	61427.4	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13406.00 = 120711.00 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	236.24	12.70	3.317	0.30( 0.30)	1.00	87.0	21100.00

LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 13406.00 = 2859.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	27102.30	12.70	3.317	0.30( 0.29)	0.97	3359.3	21100.00
2	29716.18	18.94	2.522	0.30( 0.29)	0.97	4967.8	50600.00
3	30403.95	21.65	2.308	0.30( 0.29)	0.97	5733.0	50500.00
4	32917.86	28.96	1.916	0.30( 0.29)	0.97	7793.8	30600.00
5	36124.47	36.44	1.705	0.30( 0.29)	0.97	11065.4	30200.00
6	37814.09	40.65	1.600	0.30( 0.29)	0.97	13124.3	30110.00
7	39530.40	46.77	1.468	0.30( 0.29)	0.97	16212.0	31810.00
8	40207.41	50.26	1.395	0.30( 0.29)	0.97	18062.7	31400.00
9	42165.12	59.96	1.287	0.30( 0.29)	0.96	22992.3	13100.00
10	43838.45	66.54	1.243	0.30( 0.29)	0.96	25910.0	11801.00
11	46183.30	75.90	1.179	0.30( 0.29)	0.97	30685.1	11530.00
12	48585.21	86.44	1.108	0.30( 0.29)	0.97	37492.4	13010.00
13	49757.53	91.37	1.078	0.30( 0.29)	0.97	40716.3	11330.00
14	50501.85	97.67	1.049	0.30( 0.29)	0.97	45146.7	11130.00
15	50038.47	105.27	1.014	0.30( 0.29)	0.98	49136.9	12330.00
16	49495.11	111.93	0.984	0.30( 0.29)	0.98	52480.0	12400.00
17	48583.87	120.62	0.945	0.30( 0.29)	0.98	55847.3	12201.00
18	47980.04	124.61	0.935	0.30( 0.29)	0.98	56933.6	12111.00
19	47178.80	130.01	0.921	0.30( 0.29)	0.98	58303.0	12101.10
20	46546.36	134.05	0.910	0.30( 0.29)	0.98	59153.7	10400.00
21	44808.92	142.12	0.889	0.30( 0.29)	0.98	60465.8	12010.00
22	43356.33	148.07	0.874	0.30( 0.29)	0.98	60782.4	10210.00
23	39267.48	174.31	0.806	0.30( 0.29)	0.98	61514.4	10100.00

TOTAL AREA (ACRES) = 61514.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 50501.85 Tc (MIN.) = 97.668  
EFFECTIVE AREA (ACRES) = 45146.68 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA (ACRES) = 61514.4  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13406.00 = 120711.00 FEET.

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FLOW PROCESS FROM NODE 13406.00 TO NODE 13408.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 195.00 DOWNSTREAM (FEET) = 182.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2458.36 CHANNEL SLOPE = 0.0053  
GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT (FEET) = 11.93

\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.038

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	12.41	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 50505.97

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 16.31

AVERAGE FLOW DEPTH (FEET) = 11.93 TRAVEL TIME (MIN.) = 2.51

Tc (MIN.) = 100.18

SUBAREA AREA (ACRES) = 12.41 SUBAREA RUNOFF (CFS) = 8.24

EFFECTIVE AREA (ACRES) = 45159.09 AREA-AVERAGED Fm (INCH/HR) = 0.29

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97

TOTAL AREA (ACRES) = 61526.8 PEAK FLOW RATE (CFS) = 50501.85

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0

"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT (FEET) = 11.93

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 11.93 FLOW VELOCITY (FEET/SEC.) = 16.30

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13408.00 = 123169.36 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	27102.30	15.77	2.846	0.30( 0.29)	0.98	3371.7	21100.00
2	29716.18	21.92	2.290	0.30( 0.29)	0.97	4980.2	50600.00
3	30403.95	24.61	2.117	0.30( 0.29)	0.97	5745.4	50500.00
4	32917.86	31.84	1.822	0.30( 0.29)	0.97	7806.3	30600.00
5	36124.47	39.24	1.633	0.30( 0.29)	0.97	11077.8	30200.00
6	37814.09	43.40	1.540	0.30( 0.29)	0.97	13136.7	30110.00
7	39530.40	49.49	1.409	0.30( 0.29)	0.97	16224.4	31810.00
8	40207.41	52.96	1.365	0.30( 0.29)	0.97	18075.1	31400.00
9	42165.12	62.62	1.269	0.30( 0.29)	0.96	23004.7	13100.00
10	43838.45	69.16	1.225	0.30( 0.29)	0.96	25922.4	11801.00
11	46183.30	78.49	1.162	0.30( 0.29)	0.97	30697.6	11530.00
12	48585.21	88.99	1.091	0.30( 0.29)	0.97	37504.9	13010.00
13	49757.53	93.89	1.066	0.30( 0.29)	0.97	40728.7	11330.00
14	50501.85	100.18	1.038	0.30( 0.29)	0.97	45159.1	11130.00
15	50038.47	107.79	1.003	0.30( 0.29)	0.98	49149.3	12330.00
16	49495.11	114.46	0.972	0.30( 0.29)	0.98	52492.4	12400.00
17	48583.87	123.17	0.939	0.30( 0.29)	0.98	55859.7	12201.00
18	47980.04	127.16	0.928	0.30( 0.29)	0.98	56946.0	12111.00
19	47178.80	132.57	0.914	0.30( 0.29)	0.98	58315.4	12101.10
20	46546.36	136.63	0.904	0.30( 0.29)	0.98	59166.1	10400.00
21	44808.92	144.73	0.883	0.30( 0.29)	0.98	60478.2	12010.00
22	43356.33	150.71	0.867	0.30( 0.29)	0.98	60794.8	10210.00
23	39267.48	177.03	0.799	0.30( 0.29)	0.98	61526.8	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 50501.85 Tc (MIN.) = 100.18

AREA-AVERAGED Fm (INCH/HR) = 0.29 AREA-AVERAGED Fp (INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA (ACRES) = 45159.09

\*\*\*\*\*

FLOW PROCESS FROM NODE 13408.00 TO NODE 13408.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13408.00 TO NODE 13408.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610507Y.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	459.67	19.60	0.30	(0.30)	0.99	236.8	50700.00
TOTAL AREA (ACRES) =							236.8

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13408.00 TO NODE 13408.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	27102.30	15.77	2.846	0.30 (0.29)	0.98	3371.7	21100.00
2	29716.18	21.92	2.290	0.30 (0.29)	0.97	4980.2	50600.00
3	30403.95	24.61	2.117	0.30 (0.29)	0.97	5745.4	50500.00
4	32917.86	31.84	1.822	0.30 (0.29)	0.97	7806.3	30600.00
5	36124.47	39.24	1.633	0.30 (0.29)	0.97	11077.8	30200.00
6	37814.09	43.40	1.540	0.30 (0.29)	0.97	13136.7	30110.00
7	39530.40	49.49	1.409	0.30 (0.29)	0.97	16224.4	31810.00
8	40207.41	52.96	1.365	0.30 (0.29)	0.97	18075.1	31400.00
9	42165.12	62.62	1.269	0.30 (0.29)	0.96	23004.7	13100.00
10	43838.45	69.16	1.225	0.30 (0.29)	0.96	25922.4	11801.00
11	46183.30	78.49	1.162	0.30 (0.29)	0.97	30697.6	11530.00
12	48585.21	88.99	1.091	0.30 (0.29)	0.97	37504.9	13010.00
13	49757.53	93.89	1.066	0.30 (0.29)	0.97	40728.7	11330.00
14	50501.85	100.18	1.038	0.30 (0.29)	0.97	45159.1	11130.00
15	50038.47	107.79	1.003	0.30 (0.29)	0.98	49149.3	12330.00
16	49495.11	114.46	0.972	0.30 (0.29)	0.98	52492.4	12400.00
17	48583.87	123.17	0.939	0.30 (0.29)	0.98	55859.7	12201.00
18	47980.04	127.16	0.928	0.30 (0.29)	0.98	56946.0	12111.00
19	47178.80	132.57	0.914	0.30 (0.29)	0.98	58315.4	12101.10
20	46546.36	136.63	0.904	0.30 (0.29)	0.98	59166.1	10400.00
21	44808.92	144.73	0.883	0.30 (0.29)	0.98	60478.2	12010.00
22	43356.33	150.71	0.867	0.30 (0.29)	0.98	60794.8	10210.00
23	39267.48	177.03	0.799	0.30 (0.29)	0.98	61526.8	10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13408.00 =							123169.36 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	459.67	19.60	2.455	0.30 (0.30)	0.99	236.8	50700.00
LONGEST FLOWPATH FROM NODE 50700.00 TO NODE 13408.00 =							7903.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	27539.27	15.77	2.846	0.30 (0.29)	0.98	3562.3	21100.00
2	29188.71	19.60	2.455	0.30 (0.29)	0.98	4609.5	50700.00
3	30140.74	21.92	2.290	0.30 (0.29)	0.98	5217.0	50600.00
4	30791.62	24.61	2.117	0.30 (0.29)	0.98	5982.2	50500.00
5	33242.67	31.84	1.822	0.30 (0.29)	0.97	8043.0	30600.00
6	36409.06	39.24	1.633	0.30 (0.29)	0.97	11314.6	30200.00
7	38078.89	43.40	1.540	0.30 (0.29)	0.97	13373.5	30110.00
8	39767.20	49.49	1.409	0.30 (0.29)	0.97	16461.2	31810.00
9	40434.84	52.96	1.365	0.30 (0.29)	0.97	18311.9	31400.00
10	42372.12	62.62	1.269	0.30 (0.29)	0.96	23241.5	13100.00
11	44036.03	69.16	1.225	0.30 (0.29)	0.96	26159.1	11801.00
12	46367.44	78.49	1.162	0.30 (0.29)	0.97	30934.3	11530.00
13	48754.21	88.99	1.091	0.30 (0.29)	0.97	37741.6	13010.00
14	49921.27	93.89	1.066	0.30 (0.29)	0.97	40965.5	11330.00
15	50659.48	100.18	1.038	0.30 (0.29)	0.97	45395.9	11130.00
16	50188.70	107.79	1.003	0.30 (0.29)	0.98	49386.1	12330.00
17	49638.85	114.46	0.972	0.30 (0.29)	0.98	52729.2	12400.00
18	48720.46	123.17	0.939	0.30 (0.29)	0.98	56096.5	12201.00
19	48114.42	127.16	0.928	0.30 (0.29)	0.98	57182.8	12111.00
20	47310.18	132.57	0.914	0.30 (0.29)	0.98	58552.2	12101.10
21	46675.49	136.63	0.904	0.30 (0.29)	0.98	59402.9	10400.00
22	44933.57	144.73	0.883	0.30 (0.29)	0.98	60715.0	12010.00
23	43477.66	150.71	0.867	0.30 (0.29)	0.98	61031.6	10210.00
24	39374.23	177.03	0.799	0.30 (0.29)	0.98	61763.6	10100.00
TOTAL AREA (ACRES) =						61763.6	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 50659.48 Tc (MIN.) = 100.181  
EFFECTIVE AREA (ACRES) = 45395.88 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA (ACRES) = 61763.6  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13408.00 = 123169.36 FEET.

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FLOW PROCESS FROM NODE 13408.00 TO NODE 13410.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 182.00 DOWNSTREAM (FEET) = 178.72  
CHANNEL LENGTH THRU SUBAREA (FEET) = 952.73 CHANNEL SLOPE = 0.0034  
GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\* ESTIMATED CHANNEL HEIGHT (FEET) = 13.46  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.032  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	3.31	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 50660.57  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 14.09  
AVERAGE FLOW DEPTH (FEET) = 13.46 TRAVEL TIME (MIN.) = 1.13  
Tc (MIN.) = 101.31  
SUBAREA AREA (ACRES) = 3.31 SUBAREA RUNOFF (CFS) = 2.18

EFFECTIVE AREA(ACRES) = 45399.19 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 61766.9 PEAK FLOW RATE(CFS) = 50659.48  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 13.46

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 13.46 FLOW VELOCITY(FEET/SEC.) = 14.09  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13410.00 = 124122.09 FEET.

**\*\* PEAK FLOW RATE TABLE \*\***

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	27539.27	17.14	2.706	0.30( 0.29)	0.98	3565.6	21100.00
2	29188.71	20.94	2.353	0.30( 0.29)	0.98	4612.9	50700.00
3	30140.74	23.25	2.205	0.30( 0.29)	0.98	5220.3	50600.00
4	30791.62	25.93	2.051	0.30( 0.29)	0.98	5985.5	50500.00
5	33242.67	33.13	1.789	0.30( 0.29)	0.97	8046.4	30600.00
6	36409.06	40.49	1.603	0.30( 0.29)	0.97	11317.9	30200.00
7	38078.89	44.64	1.514	0.30( 0.29)	0.97	13376.8	30110.00
8	39767.20	50.70	1.390	0.30( 0.29)	0.97	16464.5	31810.00
9	40434.84	54.17	1.352	0.30( 0.29)	0.97	18315.2	31400.00
10	42372.12	63.81	1.261	0.30( 0.29)	0.96	23244.8	13100.00
11	44036.03	70.34	1.217	0.30( 0.29)	0.96	26162.5	11801.00
12	46367.44	79.65	1.154	0.30( 0.29)	0.97	30937.7	11530.00
13	48754.21	90.13	1.083	0.30( 0.29)	0.97	37744.9	13010.00
14	49921.27	95.03	1.061	0.30( 0.29)	0.97	40968.8	11330.00
15	50659.48	101.31	1.032	0.30( 0.29)	0.97	45399.2	11130.00
16	50188.70	108.92	0.998	0.30( 0.29)	0.98	49389.4	12330.00
17	49638.85	115.59	0.967	0.30( 0.29)	0.98	52732.5	12400.00
18	48720.46	124.31	0.936	0.30( 0.29)	0.98	56099.8	12201.00
19	48114.42	128.31	0.925	0.30( 0.29)	0.98	57186.1	12111.00
20	47310.18	133.73	0.911	0.30( 0.29)	0.98	58555.5	12101.10
21	46675.49	137.79	0.901	0.30( 0.29)	0.98	59406.2	10400.00
22	44933.57	145.90	0.880	0.30( 0.29)	0.98	60718.3	12010.00
23	43477.66	151.89	0.864	0.30( 0.29)	0.98	61034.9	10210.00
24	39374.23	178.25	0.796	0.30( 0.29)	0.98	61766.9	10100.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 50659.48 Tc(MIN.) = 101.31  
 AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 45399.19

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13410.00 TO NODE 13410.00 IS CODE = 12  
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 >>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13410.00 TO NODE 13410.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<  
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PEAK FLOWRATE TABLE FILE NAME: S36.DNA  
 MEMORY BANK # 3 DEFINED AS FOLLOWS:  
 STREAM Q Tc Fp(Fm) Ap Ae HEADWATER

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(ACRES)	NODE
1	3369.82	20.06	0.30( 0.30)	0.99	1283.2 21000.00
2	3447.96	22.63	0.30( 0.30)	0.99	1467.5 20810.00
3	3461.47	22.94	0.30( 0.30)	0.99	1492.5 20900.00
4	3549.79	25.39	0.30( 0.30)	0.99	1681.6 20800.00
5	3536.32	27.04	0.30( 0.30)	0.99	1795.8 20700.00
6	3573.11	34.41	0.30( 0.30)	0.99	2309.7 20600.00
7	3567.91	39.52	0.30( 0.30)	0.99	2629.8 20500.00
8	3519.35	41.73	0.30( 0.30)	0.99	2729.0 20400.00
9	3506.31	42.12	0.30( 0.30)	0.99	2741.8 20300.00
10	3466.76	44.61	0.30( 0.30)	0.99	2819.8 20210.00
11	3465.93	44.70	0.30( 0.30)	0.99	2823.3 20200.00
12	3442.02	46.31	0.30( 0.30)	0.99	2878.8 20100.00
13	3352.63	50.73	0.30( 0.30)	0.98	3021.9 13600.00
14	3067.43	85.03	0.30( 0.29)	0.98	4004.9 13510.00
15	2923.76	93.41	0.30( 0.29)	0.97	4067.7 13500.00
TOTAL AREA(ACRES) =		4067.7			

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13410.00 TO NODE 13410.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<  
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**\*\* MAIN STREAM CONFLUENCE DATA \*\***

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	27539.27	17.14	2.706	0.30( 0.29)	0.98	3565.6	21100.00
2	29188.71	20.94	2.353	0.30( 0.29)	0.98	4612.9	50700.00
3	30140.74	23.25	2.205	0.30( 0.29)	0.98	5220.3	50600.00
4	30791.62	25.93	2.051	0.30( 0.29)	0.98	5985.5	50500.00
5	33242.67	33.13	1.789	0.30( 0.29)	0.97	8046.4	30600.00
6	36409.06	40.49	1.603	0.30( 0.29)	0.97	11317.9	30200.00
7	38078.89	44.64	1.514	0.30( 0.29)	0.97	13376.8	30110.00
8	39767.20	50.70	1.390	0.30( 0.29)	0.97	16464.5	31810.00
9	40434.84	54.17	1.352	0.30( 0.29)	0.97	18315.2	31400.00
10	42372.12	63.81	1.261	0.30( 0.29)	0.96	23244.8	13100.00
11	44036.03	70.34	1.217	0.30( 0.29)	0.96	26162.5	11801.00
12	46367.44	79.65	1.154	0.30( 0.29)	0.97	30937.7	11530.00
13	48754.21	90.13	1.083	0.30( 0.29)	0.97	37744.9	13010.00
14	49921.27	95.03	1.061	0.30( 0.29)	0.97	40968.8	11330.00
15	50659.48	101.31	1.032	0.30( 0.29)	0.97	45399.2	11130.00
16	50188.70	108.92	0.998	0.30( 0.29)	0.98	49389.4	12330.00
17	49638.85	115.59	0.967	0.30( 0.29)	0.98	52732.5	12400.00
18	48720.46	124.31	0.936	0.30( 0.29)	0.98	56099.8	12201.00
19	48114.42	128.31	0.925	0.30( 0.29)	0.98	57186.1	12111.00
20	47310.18	133.73	0.911	0.30( 0.29)	0.98	58555.5	12101.10
21	46675.49	137.79	0.901	0.30( 0.29)	0.98	59406.2	10400.00
22	44933.57	145.90	0.880	0.30( 0.29)	0.98	60718.3	12010.00
23	43477.66	151.89	0.864	0.30( 0.29)	0.98	61034.9	10210.00
24	39374.23	178.25	0.796	0.30( 0.29)	0.98	61766.9	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13410.00 = 124122.09 FEET.

**\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\***

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3369.82	20.06	2.410	0.30( 0.30)	0.99	1283.2	21000.00
2	3447.96	22.63	2.244	0.30( 0.30)	0.99	1467.5	20810.00

3	3461.47	22.94	2.225	0.30 ( 0.30)	0.99	1492.5	20900.00
4	3549.79	25.39	2.075	0.30 ( 0.30)	0.99	1681.6	20800.00
5	3536.32	27.04	2.001	0.30 ( 0.30)	0.99	1795.8	20700.00
6	3573.11	34.41	1.757	0.30 ( 0.30)	0.99	2309.7	20600.00
7	3567.91	39.52	1.626	0.30 ( 0.30)	0.99	2629.8	20500.00
8	3519.35	41.73	1.577	0.30 ( 0.30)	0.99	2729.0	20400.00
9	3506.31	42.12	1.568	0.30 ( 0.30)	0.99	2741.8	20300.00
10	3466.76	44.61	1.514	0.30 ( 0.30)	0.99	2819.8	20210.00
11	3465.93	44.70	1.512	0.30 ( 0.30)	0.99	2823.3	20200.00
12	3442.02	46.31	1.478	0.30 ( 0.30)	0.99	2878.8	20100.00
13	3352.63	50.73	1.390	0.30 ( 0.30)	0.98	3021.9	13600.00
14	3067.43	85.03	1.118	0.30 ( 0.29)	0.98	4004.9	13510.00
15	2923.76	93.41	1.068	0.30 ( 0.29)	0.97	4067.7	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13410.00 = 40827.58 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	30821.93	17.14	2.706	0.30 ( 0.29)	0.98	4661.9	21100.00
2	32176.25	20.06	2.410	0.30 ( 0.29)	0.98	5653.3	21000.00
3	32585.29	20.94	2.353	0.30 ( 0.29)	0.98	5959.2	50700.00
4	33334.21	22.63	2.244	0.30 ( 0.29)	0.98	6525.4	20810.00
5	33472.45	22.94	2.225	0.30 ( 0.29)	0.98	6630.0	20900.00
6	33613.54	23.25	2.205	0.30 ( 0.29)	0.98	6737.1	50600.00
7	34209.70	25.39	2.075	0.30 ( 0.29)	0.98	7512.2	20800.00
8	34336.98	25.93	2.051	0.30 ( 0.29)	0.98	7704.6	50500.00
9	34705.48	27.04	2.001	0.30 ( 0.29)	0.98	8098.7	20700.00
10	36809.37	33.13	1.789	0.30 ( 0.29)	0.98	10266.5	30600.00
11	37367.91	34.41	1.757	0.30 ( 0.29)	0.98	10926.5	20600.00
12	39560.30	39.52	1.626	0.30 ( 0.29)	0.98	13517.2	20500.00
13	39955.69	40.49	1.603	0.30 ( 0.29)	0.98	13991.2	30200.00
14	40428.97	41.73	1.577	0.30 ( 0.29)	0.98	14664.1	20400.00
15	40572.92	42.12	1.568	0.30 ( 0.29)	0.97	14870.5	20300.00
16	41534.49	44.61	1.514	0.30 ( 0.29)	0.97	16182.8	20210.00
17	41545.41	44.64	1.514	0.30 ( 0.29)	0.97	16197.6	30110.00
18	41563.37	44.70	1.512	0.30 ( 0.29)	0.97	16234.1	20200.00
19	41986.26	46.31	1.478	0.30 ( 0.29)	0.97	17106.7	20100.00
20	43120.32	50.70	1.390	0.30 ( 0.29)	0.97	19485.7	31810.00
21	43124.54	50.73	1.390	0.30 ( 0.29)	0.97	19499.5	13600.00
22	43758.85	54.17	1.352	0.30 ( 0.29)	0.97	21435.7	31400.00
23	45615.95	63.81	1.261	0.30 ( 0.29)	0.97	26641.8	13100.00
24	47225.56	70.34	1.217	0.30 ( 0.29)	0.97	29746.5	11801.00
25	49479.62	79.65	1.154	0.30 ( 0.29)	0.97	34788.3	11530.00
26	50660.06	85.03	1.118	0.30 ( 0.29)	0.97	38436.9	13510.00
27	51734.21	90.13	1.083	0.30 ( 0.29)	0.97	41788.1	13010.00
28	52460.18	93.41	1.068	0.30 ( 0.29)	0.97	43973.4	13500.00
29	52817.26	95.03	1.061	0.30 ( 0.29)	0.97	45036.6	11330.00
30	53447.40	101.31	1.032	0.30 ( 0.29)	0.97	49466.9	11130.00
31	52845.76	108.92	0.998	0.30 ( 0.29)	0.98	53457.1	12330.00
32	52181.11	115.59	0.967	0.30 ( 0.29)	0.98	56800.2	12400.00
33	51144.68	124.31	0.936	0.30 ( 0.29)	0.98	60167.6	12201.00
34	50499.48	128.31	0.925	0.30 ( 0.29)	0.98	61253.8	12111.00
35	49642.18	133.73	0.911	0.30 ( 0.29)	0.98	62623.2	12101.10
36	48967.72	137.79	0.901	0.30 ( 0.29)	0.98	63473.9	10400.00
37	47146.36	145.90	0.880	0.30 ( 0.29)	0.98	64786.1	12010.00
38	45631.75	151.89	0.864	0.30 ( 0.29)	0.98	65102.6	10210.00
39	41270.19	178.25	0.796	0.30 ( 0.29)	0.98	65834.6	10100.00

TOTAL AREA (ACRES) = 65834.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 53447.40 Tc(MIN.) = 101.308  
EFFECTIVE AREA(ACRES) = 49466.93 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA(ACRES) = 65834.6  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13410.00 = 124122.09 FEET.

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FLOW PROCESS FROM NODE 13410.00 TO NODE 13412.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 178.72 DOWNSTREAM(FEET) = 176.93  
CHANNEL LENGTH THRU SUBAREA(FEET) = 169.78 CHANNEL SLOPE = 0.0105  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 10.15  
CHANNEL FLOW THRU SUBAREA(CFS) = 53447.40  
FLOW VELOCITY(FEET/SEC.) = 21.00 FLOW DEPTH(FEET) = 10.15  
TRAVEL TIME(MIN.) = 0.13 Tc(MIN.) = 101.44  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 124291.87 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	30821.93	17.30	2.690	0.30 ( 0.29)	0.98	4661.9	21100.00
2	32176.25	20.22	2.400	0.30 ( 0.29)	0.98	5653.3	21000.00
3	32585.29	21.10	2.343	0.30 ( 0.29)	0.98	5959.2	50700.00
4	33334.21	22.79	2.234	0.30 ( 0.29)	0.98	6525.4	20810.00
5	33472.45	23.09	2.215	0.30 ( 0.29)	0.98	6630.0	20900.00
6	33613.54	23.41	2.195	0.30 ( 0.29)	0.98	6737.1	50600.00
7	34209.70	25.54	2.068	0.30 ( 0.29)	0.98	7512.2	20800.00
8	34336.98	26.09	2.044	0.30 ( 0.29)	0.98	7704.6	50500.00
9	34705.48	27.19	1.994	0.30 ( 0.29)	0.98	8098.7	20700.00
10	36809.37	33.28	1.785	0.30 ( 0.29)	0.98	10266.5	30600.00
11	37367.91	34.56	1.753	0.30 ( 0.29)	0.98	10926.5	20600.00
12	39560.30	39.67	1.622	0.30 ( 0.29)	0.98	13517.2	20500.00
13	39955.69	40.64	1.600	0.30 ( 0.29)	0.98	13991.2	30200.00
14	40428.97	41.88	1.573	0.30 ( 0.29)	0.98	14664.1	20400.00
15	40572.92	42.27	1.565	0.30 ( 0.29)	0.97	14870.5	20300.00
16	41534.49	44.76	1.511	0.30 ( 0.29)	0.97	16182.8	20210.00
17	41545.41	44.78	1.511	0.30 ( 0.29)	0.97	16197.6	30110.00
18	41563.37	44.85	1.509	0.30 ( 0.29)	0.97	16234.1	20200.00
19	41986.26	46.46	1.475	0.30 ( 0.29)	0.97	17106.7	20100.00
20	43120.32	50.85	1.389	0.30 ( 0.29)	0.97	19485.7	31810.00
21	43124.54	50.87	1.388	0.30 ( 0.29)	0.97	19499.5	13600.00
22	43758.85	54.32	1.350	0.30 ( 0.29)	0.97	21435.7	31400.00
23	45615.95	63.96	1.260	0.30 ( 0.29)	0.97	26641.8	13100.00
24	47225.56	70.48	1.216	0.30 ( 0.29)	0.97	29746.5	11801.00
25	49479.62	79.78	1.153	0.30 ( 0.29)	0.97	34788.3	11530.00
26	50660.06	85.16	1.117	0.30 ( 0.29)	0.97	38436.9	13510.00
27	51734.21	90.27	1.083	0.30 ( 0.29)	0.97	41788.1	13010.00
28	52460.18	93.55	1.068	0.30 ( 0.29)	0.97	43973.4	13500.00
29	52817.26	95.16	1.060	0.30 ( 0.29)	0.97	45036.6	11330.00
30	53447.40	101.44	1.032	0.30 ( 0.29)	0.97	49466.9	11130.00
31	52845.76	109.05	0.997	0.30 ( 0.29)	0.98	53457.1	12330.00

32 52181.11 115.73 0.967 0.30( 0.29) 0.98 56800.2 12400.00  
33 51144.68 124.45 0.935 0.30( 0.29) 0.98 60167.6 12201.00  
34 50499.48 128.44 0.925 0.30( 0.29) 0.98 61253.8 12111.00  
35 49642.18 133.86 0.911 0.30( 0.29) 0.98 62623.2 12101.10  
36 48967.72 137.93 0.900 0.30( 0.29) 0.98 63473.9 10400.00  
37 47146.36 146.04 0.879 0.30( 0.29) 0.98 64786.1 12010.00  
38 45631.75 152.04 0.864 0.30( 0.29) 0.98 65102.6 10210.00  
39 41270.19 178.40 0.795 0.30( 0.29) 0.98 65834.6 10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 53447.40 Tc(MIN.) = 101.44  
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 49466.93

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13412.00 TO NODE 13412.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13412.00 TO NODE 13412.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<<

PEAK FLOWRATE TABLE FILE NAME: 0509101Y.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	751.66	35.61	0.30( 0.30)	1.00	585.7	10100.00

TOTAL AREA(ACRES) = 585.7

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13412.00 TO NODE 13412.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	30821.93	17.30	2.690	0.30( 0.29)	0.98	4661.9	21100.00
2	32176.25	20.22	2.400	0.30( 0.29)	0.98	5653.3	21000.00
3	32585.29	21.10	2.343	0.30( 0.29)	0.98	5959.2	50700.00
4	33334.21	22.79	2.234	0.30( 0.29)	0.98	6525.4	20810.00
5	33472.45	23.09	2.215	0.30( 0.29)	0.98	6630.0	20900.00
6	33613.54	23.41	2.195	0.30( 0.29)	0.98	6737.1	50600.00
7	34209.70	25.54	2.068	0.30( 0.29)	0.98	7512.2	20800.00
8	34336.98	26.09	2.044	0.30( 0.29)	0.98	7704.6	50500.00
9	34705.48	27.19	1.994	0.30( 0.29)	0.98	8098.7	20700.00
10	36809.37	33.28	1.785	0.30( 0.29)	0.98	10266.5	30600.00
11	37367.91	34.56	1.753	0.30( 0.29)	0.98	10926.5	20600.00
12	39560.30	39.67	1.622	0.30( 0.29)	0.98	13517.2	20500.00
13	39955.69	40.64	1.600	0.30( 0.29)	0.98	13991.2	30200.00
14	40428.97	41.88	1.573	0.30( 0.29)	0.98	14664.1	20400.00
15	40572.92	42.27	1.565	0.30( 0.29)	0.97	14870.5	20300.00
16	41534.49	44.76	1.511	0.30( 0.29)	0.97	16182.8	20210.00
17	41545.41	44.78	1.511	0.30( 0.29)	0.97	16197.6	30110.00
18	41563.37	44.85	1.509	0.30( 0.29)	0.97	16234.1	20200.00

19 41986.26 46.46 1.475 0.30( 0.29) 0.97 17106.7 20100.00  
20 43120.32 50.85 1.389 0.30( 0.29) 0.97 19485.7 31810.00  
21 43124.54 50.87 1.388 0.30( 0.29) 0.97 19499.5 13600.00  
22 43758.85 54.32 1.350 0.30( 0.29) 0.97 21435.7 31400.00  
23 45615.95 63.96 1.260 0.30( 0.29) 0.97 26641.8 13100.00  
24 47225.56 70.48 1.216 0.30( 0.29) 0.97 29746.5 11801.00  
25 49479.62 79.78 1.153 0.30( 0.29) 0.97 34788.3 11530.00  
26 50660.06 85.16 1.117 0.30( 0.29) 0.97 38436.9 13510.00  
27 51734.21 90.27 1.083 0.30( 0.29) 0.97 41788.1 13010.00  
28 52460.18 93.55 1.068 0.30( 0.29) 0.97 43973.4 13500.00  
29 52817.26 95.16 1.060 0.30( 0.29) 0.97 45036.6 11330.00  
30 53447.40 101.44 1.032 0.30( 0.29) 0.97 49466.9 11130.00  
31 52845.76 109.05 0.997 0.30( 0.29) 0.98 53457.1 12330.00  
32 52181.11 115.73 0.967 0.30( 0.29) 0.98 56800.2 12400.00  
33 51144.68 124.45 0.935 0.30( 0.29) 0.98 60167.6 12201.00  
34 50499.48 128.44 0.925 0.30( 0.29) 0.98 61253.8 12111.00  
35 49642.18 133.86 0.911 0.30( 0.29) 0.98 62623.2 12101.10  
36 48967.72 137.93 0.900 0.30( 0.29) 0.98 63473.9 10400.00  
37 47146.36 146.04 0.879 0.30( 0.29) 0.98 64786.1 12010.00  
38 45631.75 152.04 0.864 0.30( 0.29) 0.98 65102.6 10210.00  
39 41270.19 178.40 0.795 0.30( 0.29) 0.98 65834.6 10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 124291.87 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	751.66	35.61	1.726	0.30( 0.30)	1.00	585.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 14724.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31433.97	17.30	2.690	0.30( 0.29)	0.98	4946.5	21100.00
2	32804.75	20.22	2.400	0.30( 0.29)	0.98	5985.9	21000.00
3	33223.44	21.10	2.343	0.30( 0.29)	0.98	6306.2	50700.00
4	33986.75	22.79	2.234	0.30( 0.29)	0.98	6900.2	20810.00
5	34126.99	23.09	2.215	0.30( 0.29)	0.98	7009.9	20900.00
6	34269.98	23.41	2.195	0.30( 0.29)	0.98	7122.1	50600.00
7	34878.11	25.54	2.068	0.30( 0.29)	0.98	7932.4	20800.00
8	35010.24	26.09	2.044	0.30( 0.29)	0.98	8133.6	50500.00
9	35387.44	27.19	1.994	0.30( 0.29)	0.98	8546.0	20700.00
10	37541.10	33.28	1.785	0.30( 0.29)	0.98	10813.9	30600.00
11	38111.11	34.56	1.753	0.30( 0.29)	0.98	11495.0	20600.00
12	38569.55	35.61	1.726	0.30( 0.29)	0.98	12044.0	10100.00
13	40257.38	39.67	1.622	0.30( 0.29)	0.98	14103.0	20500.00
14	40641.06	40.64	1.600	0.30( 0.29)	0.98	14576.9	30200.00
15	41100.20	41.88	1.573	0.30( 0.29)	0.98	15249.9	20400.00
16	41239.72	42.27	1.565	0.30( 0.29)	0.98	15456.2	20300.00
17	42173.01	44.76	1.511	0.30( 0.29)	0.97	16768.6	20210.00
18	42183.61	44.78	1.511	0.30( 0.29)	0.97	16783.4	30110.00
19	42200.82	44.85	1.509	0.30( 0.29)	0.97	16819.8	20200.00
20	42605.43	46.46	1.475	0.30( 0.29)	0.97	17692.4	20100.00
21	43694.16	50.85	1.389	0.30( 0.29)	0.97	20071.4	31810.00
22	43698.23	50.87	1.388	0.30( 0.29)	0.97	20085.2	13600.00
23	44312.41	54.32	1.350	0.30( 0.29)	0.97	22021.5	31400.00
24	46122.13	63.96	1.260	0.30( 0.29)	0.97	27227.5	13100.00
25	47708.47	70.48	1.216	0.30( 0.29)	0.97	30332.2	11801.00
26	49929.36	79.78	1.153	0.30( 0.29)	0.97	35374.0	11530.00

27	51090.61	85.16	1.117	0.30	( 0.29)	0.97	39022.6	13510.00
28	52146.87	90.27	1.083	0.30	( 0.29)	0.97	42373.8	13010.00
29	52864.94	93.55	1.068	0.30	( 0.29)	0.97	44559.2	13500.00
30	53218.13	95.16	1.060	0.30	( 0.29)	0.97	45622.3	11330.00
31	53833.15	101.44	1.032	0.30	( 0.29)	0.97	50052.7	11130.00
32	53213.19	109.05	0.997	0.30	( 0.29)	0.98	54042.9	12330.00
33	52532.47	115.73	0.967	0.30	( 0.29)	0.98	57385.9	12400.00
34	51479.66	124.45	0.935	0.30	( 0.29)	0.98	60753.3	12201.00
35	50828.98	128.44	0.925	0.30	( 0.29)	0.98	61839.6	12111.00
36	49964.27	133.86	0.911	0.30	( 0.29)	0.98	63208.9	12101.10
37	49284.23	137.93	0.900	0.30	( 0.29)	0.98	64059.7	10400.00
38	47451.75	146.04	0.879	0.30	( 0.29)	0.98	65371.8	12010.00
39	45928.92	152.04	0.864	0.30	( 0.29)	0.98	65688.3	10210.00
40	41531.23	178.40	0.795	0.30	( 0.29)	0.98	66420.4	10100.00

TOTAL AREA (ACRES) = 66420.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 53833.15 Tc (MIN.) = 101.443  
EFFECTIVE AREA (ACRES) = 50052.65 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA (ACRES) = 66420.4  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 124291.87 FEET.

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FLOW PROCESS FROM NODE 13412.00 TO NODE 13700.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 176.93 DOWNSTREAM (FEET) = 173.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 260.10 CHANNEL SLOPE = 0.0151  
GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 9.21  
CHANNEL FLOW THRU SUBAREA (CFS) = 53833.15  
FLOW VELOCITY (FEET/SEC.) = 23.77 FLOW DEPTH (FEET) = 9.21  
TRAVEL TIME (MIN.) = 0.18 Tc (MIN.) = 101.63  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13700.00 = 124551.97 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31433.97	17.52	2.667	0.30 ( 0.29)	0.98	4946.5	21100.00
2	32804.75	20.44	2.386	0.30 ( 0.29)	0.98	5985.9	21000.00
3	33223.44	21.32	2.329	0.30 ( 0.29)	0.98	6306.2	50700.00
4	33986.75	23.00	2.221	0.30 ( 0.29)	0.98	6900.2	20810.00
5	34126.99	23.31	2.201	0.30 ( 0.29)	0.98	7009.9	20900.00
6	34269.98	23.62	2.181	0.30 ( 0.29)	0.98	7122.1	50600.00
7	34878.11	25.75	2.058	0.30 ( 0.29)	0.98	7932.4	20800.00
8	35010.24	26.30	2.034	0.30 ( 0.29)	0.98	8133.6	50500.00
9	35387.44	27.40	1.985	0.30 ( 0.29)	0.98	8546.0	20700.00
10	37541.10	33.48	1.780	0.30 ( 0.29)	0.98	10813.9	30600.00
11	38111.11	34.77	1.747	0.30 ( 0.29)	0.98	11495.0	20600.00
12	38569.55	35.82	1.721	0.30 ( 0.29)	0.98	12044.0	10100.00
13	40257.38	39.87	1.617	0.30 ( 0.29)	0.98	14103.0	20500.00
14	40641.06	40.84	1.596	0.30 ( 0.29)	0.98	14576.9	30200.00
15	41100.20	42.08	1.569	0.30 ( 0.29)	0.98	15249.9	20400.00
16	41239.72	42.47	1.561	0.30 ( 0.29)	0.98	15456.2	20300.00

17	42173.01	44.95	1.507	0.30	( 0.29)	0.97	16768.6	20210.00
18	42183.61	44.98	1.506	0.30	( 0.29)	0.97	16783.4	30110.00
19	42200.82	45.05	1.505	0.30	( 0.29)	0.97	16819.8	20200.00
20	42605.43	46.65	1.470	0.30	( 0.29)	0.97	17692.4	20100.00
21	43694.16	51.04	1.386	0.30	( 0.29)	0.97	20071.4	31810.00
22	43698.23	51.07	1.386	0.30	( 0.29)	0.97	20085.2	13600.00
23	44312.41	54.51	1.348	0.30	( 0.29)	0.97	22021.5	31400.00
24	46122.13	64.15	1.259	0.30	( 0.29)	0.97	27227.5	13100.00
25	47708.47	70.67	1.215	0.30	( 0.29)	0.97	30332.2	11801.00
26	49929.36	79.97	1.152	0.30	( 0.29)	0.97	35374.0	11530.00
27	51090.61	85.35	1.115	0.30	( 0.29)	0.97	39022.6	13510.00
28	52146.87	90.45	1.082	0.30	( 0.29)	0.97	42373.8	13010.00
29	52864.94	93.73	1.067	0.30	( 0.29)	0.97	44559.2	13500.00
30	53218.13	95.34	1.060	0.30	( 0.29)	0.97	45622.3	11330.00
31	53833.15	101.63	1.031	0.30	( 0.29)	0.97	50052.7	11130.00
32	53213.19	109.23	0.996	0.30	( 0.29)	0.98	54042.9	12330.00
33	52532.47	115.91	0.966	0.30	( 0.29)	0.98	57385.9	12400.00
34	51479.66	124.63	0.935	0.30	( 0.29)	0.98	60753.3	12201.00
35	50828.98	128.63	0.925	0.30	( 0.29)	0.98	61839.6	12111.00
36	49964.27	134.05	0.910	0.30	( 0.29)	0.98	63208.9	12101.10
37	49284.23	138.11	0.900	0.30	( 0.29)	0.98	64059.7	10400.00
38	47451.75	146.23	0.879	0.30	( 0.29)	0.98	65371.8	12010.00
39	45928.92	152.23	0.863	0.30	( 0.29)	0.98	65688.3	10210.00
40	41531.23	178.60	0.795	0.30	( 0.29)	0.98	66420.4	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 53833.15 Tc (MIN.) = 101.63  
AREA-AVERAGED Fm (INCH/HR) = 0.29 AREA-AVERAGED Fp (INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA (ACRES) = 50052.65

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FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<<

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FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610508Y.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	246.57	20.47	0.30 ( 0.30)	0.99	131.3	50800.00	
TOTAL AREA (ACRES) = 131.3							

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FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31433.97	17.52	2.667	0.30 ( 0.29)	0.98	4946.5	21100.00
2	32804.75	20.44	2.386	0.30 ( 0.29)	0.98	5985.9	21000.00

3	33223.44	21.32	2.329	0.30 ( 0.29)	0.98	6306.2	50700.00
4	33986.75	23.00	2.221	0.30 ( 0.29)	0.98	6900.2	20810.00
5	34126.99	23.31	2.201	0.30 ( 0.29)	0.98	7009.9	20900.00
6	34269.98	23.62	2.181	0.30 ( 0.29)	0.98	7122.1	50600.00
7	34878.11	25.75	2.058	0.30 ( 0.29)	0.98	7932.4	20800.00
8	35010.24	26.30	2.034	0.30 ( 0.29)	0.98	8133.6	50500.00
9	35387.44	27.40	1.985	0.30 ( 0.29)	0.98	8546.0	20700.00
10	37541.10	33.48	1.780	0.30 ( 0.29)	0.98	10813.9	30600.00
11	38111.11	34.77	1.747	0.30 ( 0.29)	0.98	11495.0	20600.00
12	38569.55	35.82	1.721	0.30 ( 0.29)	0.98	12044.0	10100.00
13	40257.38	39.87	1.617	0.30 ( 0.29)	0.98	14103.0	20500.00
14	40641.06	40.84	1.596	0.30 ( 0.29)	0.98	14576.9	30200.00
15	41100.20	42.08	1.569	0.30 ( 0.29)	0.98	15249.9	20400.00
16	41239.72	42.47	1.561	0.30 ( 0.29)	0.98	15456.2	20300.00
17	42173.01	44.95	1.507	0.30 ( 0.29)	0.97	16768.6	20210.00
18	42183.61	44.98	1.506	0.30 ( 0.29)	0.97	16783.4	30110.00
19	42200.82	45.05	1.505	0.30 ( 0.29)	0.97	16819.8	20200.00
20	42605.43	46.65	1.470	0.30 ( 0.29)	0.97	17692.4	20100.00
21	43694.16	51.04	1.386	0.30 ( 0.29)	0.97	20071.4	31810.00
22	43698.23	51.07	1.386	0.30 ( 0.29)	0.97	20085.2	13600.00
23	44312.41	54.51	1.348	0.30 ( 0.29)	0.97	22021.5	31400.00
24	46122.13	64.15	1.259	0.30 ( 0.29)	0.97	27227.5	13100.00
25	47708.47	70.67	1.215	0.30 ( 0.29)	0.97	30332.2	11801.00
26	49929.36	79.97	1.152	0.30 ( 0.29)	0.97	35374.0	11530.00
27	51090.61	85.35	1.115	0.30 ( 0.29)	0.97	39022.6	13510.00
28	52146.87	90.45	1.082	0.30 ( 0.29)	0.97	42373.8	13010.00
29	52864.94	93.73	1.067	0.30 ( 0.29)	0.97	44559.2	13500.00
30	53218.13	95.34	1.060	0.30 ( 0.29)	0.97	45622.3	11330.00
31	53833.15	101.63	1.031	0.30 ( 0.29)	0.97	50052.7	11130.00
32	53213.19	109.23	0.996	0.30 ( 0.29)	0.98	54042.9	12330.00
33	52532.47	115.91	0.966	0.30 ( 0.29)	0.98	57385.9	12400.00
34	51479.66	124.63	0.935	0.30 ( 0.29)	0.98	60753.3	12201.00
35	50828.98	128.63	0.925	0.30 ( 0.29)	0.98	61839.6	12111.00
36	49964.27	134.05	0.910	0.30 ( 0.29)	0.98	63208.9	12101.10
37	49284.23	138.11	0.900	0.30 ( 0.29)	0.98	64059.7	10400.00
38	47451.75	146.23	0.879	0.30 ( 0.29)	0.98	65371.8	12010.00
39	45928.92	152.23	0.863	0.30 ( 0.29)	0.98	65688.3	10210.00
40	41531.23	178.60	0.795	0.30 ( 0.29)	0.98	66420.4	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13700.00 = 124551.97 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	246.57	20.47	2.384	0.30 ( 0.30)	0.99	131.3	50800.00

LONGEST FLOWPATH FROM NODE 50800.00 TO NODE 13700.00 = 5946.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31673.70	17.52	2.667	0.30 ( 0.29)	0.98	5058.9	21100.00
2	33051.17	20.44	2.386	0.30 ( 0.29)	0.98	6116.9	21000.00
3	33067.00	20.47	2.384	0.30 ( 0.29)	0.98	6129.2	50800.00
4	33463.57	21.32	2.329	0.30 ( 0.29)	0.98	6437.5	50700.00
5	34214.04	23.00	2.221	0.30 ( 0.29)	0.98	7031.5	20810.00
6	34351.98	23.31	2.201	0.30 ( 0.29)	0.98	7141.1	20900.00
7	34492.58	23.62	2.181	0.30 ( 0.29)	0.98	7253.3	50600.00
8	35086.23	25.75	2.058	0.30 ( 0.29)	0.98	8063.6	20800.00
9	35215.50	26.30	2.034	0.30 ( 0.29)	0.98	8264.9	50500.00

10	35586.87	27.40	1.985	0.30 ( 0.29)	0.98	8677.2	20700.00
11	37716.36	33.48	1.780	0.30 ( 0.29)	0.98	10945.1	30600.00
12	38282.51	34.77	1.747	0.30 ( 0.29)	0.98	11626.2	20600.00
13	38737.79	35.82	1.721	0.30 ( 0.29)	0.98	12175.2	10100.00
14	40413.39	39.87	1.617	0.30 ( 0.29)	0.98	14234.2	20500.00
15	40794.54	40.84	1.596	0.30 ( 0.29)	0.98	14708.2	30200.00
16	41250.52	42.08	1.569	0.30 ( 0.29)	0.98	15381.1	20400.00
17	41389.05	42.47	1.561	0.30 ( 0.29)	0.98	15587.5	20300.00
18	42316.00	44.95	1.507	0.30 ( 0.29)	0.97	16899.8	20210.00
19	42326.54	44.98	1.506	0.30 ( 0.29)	0.97	16914.6	30110.00
20	42343.57	45.05	1.505	0.30 ( 0.29)	0.97	16951.1	20200.00
21	42744.09	46.65	1.470	0.30 ( 0.29)	0.97	17823.7	20100.00
22	43822.91	51.04	1.386	0.30 ( 0.29)	0.97	20202.7	31810.00
23	43826.95	51.07	1.386	0.30 ( 0.29)	0.97	20216.5	13600.00
24	44436.62	54.51	1.348	0.30 ( 0.29)	0.97	22152.7	31400.00
25	46235.82	64.15	1.259	0.30 ( 0.29)	0.97	27358.8	13100.00
26	47816.95	70.67	1.215	0.30 ( 0.29)	0.97	30463.5	11801.00
27	50030.41	79.97	1.152	0.30 ( 0.29)	0.97	35505.3	11530.00
28	51187.35	85.35	1.115	0.30 ( 0.29)	0.97	39153.8	13510.00
29	52239.65	90.45	1.082	0.30 ( 0.29)	0.97	42505.1	13010.00
30	52955.95	93.73	1.067	0.30 ( 0.29)	0.97	44690.4	13500.00
31	53308.27	95.34	1.060	0.30 ( 0.29)	0.97	45753.6	11330.00
32	53919.91	101.63	1.031	0.30 ( 0.29)	0.97	50183.9	11130.00
33	53295.84	109.23	0.996	0.30 ( 0.29)	0.98	54174.1	12330.00
34	52611.52	115.91	0.966	0.30 ( 0.29)	0.98	57517.2	12400.00
35	51555.09	124.63	0.935	0.30 ( 0.29)	0.98	60884.6	12201.00
36	50903.18	128.63	0.925	0.30 ( 0.29)	0.98	61970.8	12111.00
37	50036.79	134.05	0.910	0.30 ( 0.29)	0.98	63340.2	12101.10
38	49355.52	138.11	0.900	0.30 ( 0.29)	0.98	64190.9	10400.00
39	47520.54	146.23	0.879	0.30 ( 0.29)	0.98	65503.1	12010.00
40	45995.87	152.23	0.863	0.30 ( 0.29)	0.98	65819.6	10210.00
41	41590.08	178.60	0.795	0.30 ( 0.29)	0.98	66551.6	10100.00

TOTAL AREA (ACRES) = 66551.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 53919.91 Tc (MIN.) = 101.625  
EFFECTIVE AREA (ACRES) = 50183.92 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA (ACRES) = 66551.6  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13700.00 = 124551.97 FEET.

=====  
END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 66551.6 TC (MIN.) = 101.63  
EFFECTIVE AREA (ACRES) = 50183.92 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.974  
PEAK FLOW RATE (CFS) = 53919.91

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31673.70	17.52	2.667	0.30 ( 0.29)	0.98	5058.9	21100.00
2	33051.17	20.44	2.386	0.30 ( 0.29)	0.98	6116.9	21000.00
3	33067.00	20.47	2.384	0.30 ( 0.29)	0.98	6129.2	50800.00
4	33463.57	21.32	2.329	0.30 ( 0.29)	0.98	6437.5	50700.00
5	34214.04	23.00	2.221	0.30 ( 0.29)	0.98	7031.5	20810.00
6	34351.98	23.31	2.201	0.30 ( 0.29)	0.98	7141.1	20900.00
7	34492.58	23.62	2.181	0.30 ( 0.29)	0.98	7253.3	50600.00
8	35086.23	25.75	2.058	0.30 ( 0.29)	0.98	8063.6	20800.00

9	35215.50	26.30	2.034	0.30	( 0.29)	0.98	8264.9	50500.00
10	35586.87	27.40	1.985	0.30	( 0.29)	0.98	8677.2	20700.00
11	37716.36	33.48	1.780	0.30	( 0.29)	0.98	10945.1	30600.00
12	38282.51	34.77	1.747	0.30	( 0.29)	0.98	11626.2	20600.00
13	38737.79	35.82	1.721	0.30	( 0.29)	0.98	12175.2	10100.00
14	40413.39	39.87	1.617	0.30	( 0.29)	0.98	14234.2	20500.00
15	40794.54	40.84	1.596	0.30	( 0.29)	0.98	14708.2	30200.00
16	41250.52	42.08	1.569	0.30	( 0.29)	0.98	15381.1	20400.00
17	41389.05	42.47	1.561	0.30	( 0.29)	0.98	15587.5	20300.00
18	42316.00	44.95	1.507	0.30	( 0.29)	0.97	16899.8	20210.00
19	42326.54	44.98	1.506	0.30	( 0.29)	0.97	16914.6	30110.00
20	42343.57	45.05	1.505	0.30	( 0.29)	0.97	16951.1	20200.00
21	42744.09	46.65	1.470	0.30	( 0.29)	0.97	17823.7	20100.00
22	43822.91	51.04	1.386	0.30	( 0.29)	0.97	20202.7	31810.00
23	43826.95	51.07	1.386	0.30	( 0.29)	0.97	20216.5	13600.00
24	44436.62	54.51	1.348	0.30	( 0.29)	0.97	22152.7	31400.00
25	46235.82	64.15	1.259	0.30	( 0.29)	0.97	27358.8	13100.00
26	47816.95	70.67	1.215	0.30	( 0.29)	0.97	30463.5	11801.00
27	50030.41	79.97	1.152	0.30	( 0.29)	0.97	35505.3	11530.00
28	51187.35	85.35	1.115	0.30	( 0.29)	0.97	39153.8	13510.00
29	52239.65	90.45	1.082	0.30	( 0.29)	0.97	42505.1	13010.00
30	52955.95	93.73	1.067	0.30	( 0.29)	0.97	44690.4	13500.00
31	53308.27	95.34	1.060	0.30	( 0.29)	0.97	45753.6	11330.00
32	53919.91	101.63	1.031	0.30	( 0.29)	0.97	50183.9	11130.00
33	53295.84	109.23	0.996	0.30	( 0.29)	0.98	54174.1	12330.00
34	52611.52	115.91	0.966	0.30	( 0.29)	0.98	57517.2	12400.00
35	51555.09	124.63	0.935	0.30	( 0.29)	0.98	60884.6	12201.00
36	50903.18	128.63	0.925	0.30	( 0.29)	0.98	61970.8	12111.00
37	50036.79	134.05	0.910	0.30	( 0.29)	0.98	63340.2	12101.10
38	49355.52	138.11	0.900	0.30	( 0.29)	0.98	64190.9	10400.00
39	47520.54	146.23	0.879	0.30	( 0.29)	0.98	65503.1	12010.00
40	45995.87	152.23	0.863	0.30	( 0.29)	0.98	65819.6	10210.00
41	41590.08	178.60	0.795	0.30	( 0.29)	0.98	66551.6	10100.00

=====  
 END OF RATIONAL METHOD ANALYSIS  
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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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Analysis prepared by:

Michael Baker International
5 Hutton Centre Drive, Suite 500
Santa Ana, CA
92707

FILE NAME: S35.DAT
TIME/DATE OF STUDY: 08:15 07/16/2018

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 4.800
2) 10.00; 3.258
3) 15.00; 2.590
4) 20.00; 2.201
5) 25.00; 1.940
6) 30.00; 1.740
7) 40.00; 1.487
8) 50.00; 1.310
9) 60.00; 1.150
10) 90.00; 0.940
11) 120.00; 0.798
12) 180.00; 0.647
13) 360.00; 0.452
14) 1440.00; 0.187

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

Table with columns: NO., WIDTH (FT), CROSSFALL (FT), IN- / SIDE, OUT- / SIDE, PARK- / WAY, CURB HEIGHT (FT), GUTTER WIDTH (FT), LIP (FT), GEOMETRIES (FT), MANNING FACTOR (n)

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 13500.00 TO NODE 13500.50 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 548.43
ELEVATION DATA: UPSTREAM(FEET) = 1183.47 DOWNSTREAM(FEET) = 1065.00

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.955
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.997

SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)
NATURAL FAIR COVER
"OPEN BRUSH" - 5.11 0.30 1.000 0 11.96
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 12.40
TOTAL AREA (ACRES) = 5.11 PEAK FLOW RATE (CFS) = 12.40

\*\*\*\*\*

FLOW PROCESS FROM NODE 13500.50 TO NODE 13501.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1065.00 DOWNSTREAM(FEET) = 1033.15
CHANNEL LENGTH THRU SUBAREA(FEET) = 431.71 CHANNEL SLOPE = 0.0738
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.52
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.755

SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN
USER-DEFINED - 8.87 0.30 1.000 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 22.21
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.98
AVERAGE FLOW DEPTH(FEET) = 0.51 TRAVEL TIME(MIN.) = 1.81
Tc(MIN.) = 13.76
SUBAREA AREA(ACRES) = 8.87 SUBAREA RUNOFF(CFS) = 19.60
EFFECTIVE AREA(ACRES) = 13.98 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 14.0 PEAK FLOW RATE(CFS) = 30.90
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.62

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.62 FLOW VELOCITY(FEET/SEC.) = 4.47
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13501.00 = 980.14 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13501.00 TO NODE 13502.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1033.15 DOWNSTREAM(FEET) = 990.26  
CHANNEL LENGTH THRU SUBAREA(FEET) = 948.63 CHANNEL SLOPE = 0.0452  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.93

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.406

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	16.82	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 46.87

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.39

AVERAGE FLOW DEPTH(FEET) = 0.91 TRAVEL TIME(MIN.) = 3.61

Tc(MIN.) = 17.37

SUBAREA AREA(ACRES) = 16.82 SUBAREA RUNOFF(CFS) = 31.88

EFFECTIVE AREA(ACRES) = 30.80 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 30.8 PEAK FLOW RATE(CFS) = 58.38

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.03

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.03 FLOW VELOCITY(FEET/SEC.) = 4.72

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13502.00 = 1928.77 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13502.00 TO NODE 13503.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 990.26 DOWNSTREAM(FEET) = 956.06  
CHANNEL LENGTH THRU SUBAREA(FEET) = 940.98 CHANNEL SLOPE = 0.0363  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.50

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.180

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	46.02	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 97.35

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.16

AVERAGE FLOW DEPTH(FEET) = 1.46 TRAVEL TIME(MIN.) = 3.04

Tc(MIN.) = 20.41

SUBAREA AREA(ACRES) = 46.02 SUBAREA RUNOFF(CFS) = 77.86

EFFECTIVE AREA(ACRES) = 76.82 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 76.8 PEAK FLOW RATE(CFS) = 129.97

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.71

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.71 FLOW VELOCITY(FEET/SEC.) = 5.65

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13503.00 = 2869.75 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13503.00 TO NODE 13504.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 956.06 DOWNSTREAM(FEET) = 889.48

CHANNEL LENGTH THRU SUBAREA(FEET) = 2131.31 CHANNEL SLOPE = 0.0312

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.13

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.879

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	58.46	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 171.61

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.81

AVERAGE FLOW DEPTH(FEET) = 2.09 TRAVEL TIME(MIN.) = 6.12

Tc(MIN.) = 26.52

SUBAREA AREA(ACRES) = 58.46 SUBAREA RUNOFF(CFS) = 83.08

EFFECTIVE AREA(ACRES) = 135.28 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 135.3 PEAK FLOW RATE(CFS) = 192.26

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.22 FLOW VELOCITY(FEET/SEC.) = 6.01

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13504.00 = 5001.06 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13504.00 TO NODE 13505.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 889.48 DOWNSTREAM(FEET) = 848.10

CHANNEL LENGTH THRU SUBAREA(FEET) = 1661.97 CHANNEL SLOPE = 0.0249

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.58

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.707

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	49.30	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 223.49  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.80  
 AVERAGE FLOW DEPTH(FEET) = 2.55 TRAVEL TIME(MIN.) = 4.78  
 Tc(MIN.) = 31.30  
 SUBAREA AREA(ACRES) = 49.30 SUBAREA RUNOFF(CFS) = 62.43  
 EFFECTIVE AREA(ACRES) = 184.58 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 184.6 PEAK FLOW RATE(CFS) = 233.75  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.62

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.62 FLOW VELOCITY(FEET/SEC.) = 5.85  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13505.00 = 6663.03 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13505.00 TO NODE 13505.50 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 848.10 DOWNSTREAM(FEET) = 811.10  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1234.61 CHANNEL SLOPE = 0.0300  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.63  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.626

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	39.35	0.30	0.811	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.811  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 258.24  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.44  
 AVERAGE FLOW DEPTH(FEET) = 2.63 TRAVEL TIME(MIN.) = 3.19  
 Tc(MIN.) = 34.50  
 SUBAREA AREA(ACRES) = 39.35 SUBAREA RUNOFF(CFS) = 48.98  
 EFFECTIVE AREA(ACRES) = 223.93 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 223.9 PEAK FLOW RATE(CFS) = 269.30  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.69

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.69 FLOW VELOCITY(FEET/SEC.) = 6.51  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13505.50 = 7897.64 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13505.50 TO NODE 13506.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 811.10 DOWNSTREAM(FEET) = 781.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1415.98 CHANNEL SLOPE = 0.0213  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.12  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.526

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	54.33	0.30	0.738	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.738  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 301.20  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.95  
 AVERAGE FLOW DEPTH(FEET) = 3.12 TRAVEL TIME(MIN.) = 3.97  
 Tc(MIN.) = 38.46  
 SUBAREA AREA(ACRES) = 54.33 SUBAREA RUNOFF(CFS) = 63.79  
 EFFECTIVE AREA(ACRES) = 278.26 AREA-AVERAGED Fm(INCH/HR) = 0.28  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.92  
 TOTAL AREA(ACRES) = 278.3 PEAK FLOW RATE(CFS) = 312.87  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.18

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.18 FLOW VELOCITY(FEET/SEC.) = 6.02  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13506.00 = 9313.62 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13506.00 TO NODE 13506.50 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 781.00 DOWNSTREAM(FEET) = 743.17  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1542.62 CHANNEL SLOPE = 0.0245  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.24  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.444

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	61.33	0.30	0.783	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.783  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 346.25  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.51  
 AVERAGE FLOW DEPTH(FEET) = 3.23 TRAVEL TIME(MIN.) = 3.95  
 Tc(MIN.) = 42.41  
 SUBAREA AREA(ACRES) = 61.33 SUBAREA RUNOFF(CFS) = 66.76  
 EFFECTIVE AREA(ACRES) = 339.59 AREA-AVERAGED Fm(INCH/HR) = 0.27  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.90  
 TOTAL AREA(ACRES) = 339.6 PEAK FLOW RATE(CFS) = 359.20  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.29

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.29 FLOW VELOCITY(FEET/SEC.) = 6.58  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13506.50 = 10856.24 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13506.50 TO NODE 13520.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 743.17 DOWNSTREAM(FEET) = 717.04  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1370.93 CHANNEL SLOPE = 0.0191  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.62  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.378

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 39.86 0.30 0.848 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.848

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 379.36  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.09  
AVERAGE FLOW DEPTH(FEET) = 3.61 TRAVEL TIME(MIN.) = 3.75  
Tc(MIN.) = 46.16

SUBAREA AREA(ACRES) = 39.86 SUBAREA RUNOFF(CFS) = 40.31  
EFFECTIVE AREA(ACRES) = 379.45 AREA-AVERAGED Fm(INCH/HR) = 0.27  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.89  
TOTAL AREA(ACRES) = 379.5 PEAK FLOW RATE(CFS) = 379.23  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.61

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.61 FLOW VELOCITY(FEET/SEC.) = 6.09  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13520.00 = 12227.17 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13506.00 TO NODE 13520.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 46.16  
RAINFALL INTENSITY(INCH/HR) = 1.38  
AREA-AVERAGED Fm(INCH/HR) = 0.27  
AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.89  
EFFECTIVE STREAM AREA(ACRES) = 379.45  
TOTAL STREAM AREA(ACRES) = 379.45  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 379.23

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13510.00 TO NODE 13511.00 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
INITIAL SUBAREA FLOW-LENGTH(FEET) = 903.68  
ELEVATION DATA: UPSTREAM(FEET) = 1216.90 DOWNSTREAM(FEET) = 1022.78

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 14.615

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.641  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"GRASS" - 6.66 0.30 1.000 0 14.62

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

SUBAREA RUNOFF(CFS) = 14.03  
TOTAL AREA(ACRES) = 6.66 PEAK FLOW RATE(CFS) = 14.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13511.00 TO NODE 13512.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1022.78 DOWNSTREAM(FEET) = 954.27  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1027.63 CHANNEL SLOPE = 0.0667  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.74  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.332

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 25.40 0.30 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 37.36  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.63  
AVERAGE FLOW DEPTH(FEET) = 0.71 TRAVEL TIME(MIN.) = 3.70  
Tc(MIN.) = 18.31

SUBAREA AREA(ACRES) = 25.40 SUBAREA RUNOFF(CFS) = 46.46  
EFFECTIVE AREA(ACRES) = 32.06 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 32.1 PEAK FLOW RATE(CFS) = 58.64  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.92

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.92 FLOW VELOCITY(FEET/SEC.) = 5.38  
LONGEST FLOWPATH FROM NODE 13510.00 TO NODE 13512.00 = 1931.31 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13512.00 TO NODE 13513.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 954.27 DOWNSTREAM(FEET) = 872.45  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1926.42 CHANNEL SLOPE = 0.0425  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.72  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.007  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 90.23 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 128.25  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.93  
 AVERAGE FLOW DEPTH(FEET) = 1.63 TRAVEL TIME(MIN.) = 5.41  
 Tc(MIN.) = 23.72  
 SUBAREA AREA(ACRES) = 90.23 SUBAREA RUNOFF(CFS) = 138.60  
 EFFECTIVE AREA(ACRES) = 122.29 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 122.3 PEAK FLOW RATE(CFS) = 187.84  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.01  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.01 FLOW VELOCITY(FEET/SEC.) = 6.66  
 LONGEST FLOWPATH FROM NODE 13510.00 TO NODE 13513.00 = 3857.73 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13513.00 TO NODE 13514.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 872.45 DOWNSTREAM(FEET) = 813.12  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1895.66 CHANNEL SLOPE = 0.0313  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 2.77  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.802  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 135.65 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 279.69  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.69  
 AVERAGE FLOW DEPTH(FEET) = 2.71 TRAVEL TIME(MIN.) = 4.72  
 Tc(MIN.) = 28.45  
 SUBAREA AREA(ACRES) = 135.65 SUBAREA RUNOFF(CFS) = 183.40  
 EFFECTIVE AREA(ACRES) = 257.94 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 257.9 PEAK FLOW RATE(CFS) = 348.73  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.04

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.04 FLOW VELOCITY(FEET/SEC.) = 7.13  
 LONGEST FLOWPATH FROM NODE 13510.00 TO NODE 13514.00 = 5753.39 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13514.00 TO NODE 13515.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 813.12 DOWNSTREAM(FEET) = 773.74  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1926.15 CHANNEL SLOPE = 0.0204  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.75  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.653  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 109.30 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 415.29  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.41  
 AVERAGE FLOW DEPTH(FEET) = 3.72 TRAVEL TIME(MIN.) = 5.01  
 Tc(MIN.) = 33.46  
 SUBAREA AREA(ACRES) = 109.30 SUBAREA RUNOFF(CFS) = 133.05  
 EFFECTIVE AREA(ACRES) = 367.24 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 367.2 PEAK FLOW RATE(CFS) = 447.05  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.86

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.86 FLOW VELOCITY(FEET/SEC.) = 6.54  
 LONGEST FLOWPATH FROM NODE 13510.00 TO NODE 13515.00 = 7679.54 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13515.00 TO NODE 13520.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 773.74 DOWNSTREAM(FEET) = 717.04  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2279.49 CHANNEL SLOPE = 0.0249  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.22  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.525  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 231.44 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 574.68  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.52

AVERAGE FLOW DEPTH(FEET) = 4.17 TRAVEL TIME(MIN.) = 5.05  
 Tc(MIN.) = 38.51  
 SUBAREA AREA(ACRES) = 231.44 SUBAREA RUNOFF(CFS) = 255.11  
 EFFECTIVE AREA(ACRES) = 598.68 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 598.7 PEAK FLOW RATE(CFS) = 659.90  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.47

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.47 FLOW VELOCITY(FEET/SEC.) = 7.80  
 LONGEST FLOWPATH FROM NODE 13510.00 TO NODE 13520.00 = 9959.03 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13515.00 TO NODE 13520.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

\*\*\*\*\*  
 TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 38.51  
 RAINFALL INTENSITY(INCH/HR) = 1.52  
 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 598.68  
 TOTAL STREAM AREA(ACRES) = 598.68  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 659.90

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	379.23	46.16	1.378	0.30( 0.27)	0.89	379.5	13500.00
2	659.90	38.51	1.525	0.30( 0.30)	1.00	598.7	13510.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1018.09	38.51	1.525	0.30( 0.29)	0.96	915.3	13510.00
2	960.09	46.16	1.378	0.30( 0.29)	0.96	978.1	13500.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 1018.09 Tc(MIN.) = 38.51  
 EFFECTIVE AREA(ACRES) = 915.25 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA(ACRES) = 978.1  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13520.00 = 12227.17 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13520.00 TO NODE 13520.50 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

\*\*\*\*\*  
 ELEVATION DATA: UPSTREAM(FEET) = 717.04 DOWNSTREAM(FEET) = 700.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2019.22 CHANNEL SLOPE = 0.0084  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.86  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.428  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	193.31	0.30	0.965	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.965  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1117.17  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.00  
 AVERAGE FLOW DEPTH(FEET) = 3.84 TRAVEL TIME(MIN.) = 4.81  
 Tc(MIN.) = 43.32  
 SUBAREA AREA(ACRES) = 193.31 SUBAREA RUNOFF(CFS) = 198.13  
 EFFECTIVE AREA(ACRES) = 1108.56 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA(ACRES) = 1171.4 PEAK FLOW RATE(CFS) = 1136.82  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.88

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.88 FLOW VELOCITY(FEET/SEC.) = 7.04  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13520.50 = 14246.39 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1136.82	43.32	1.428	0.30( 0.29)	0.96	1108.6	13510.00
2	1059.86	51.06	1.293	0.30( 0.29)	0.96	1171.4	13500.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 1136.82 Tc(MIN.) = 43.32  
 AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.96 EFFECTIVE AREA(ACRES) = 1108.56

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13520.50 TO NODE 13521.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

\*\*\*\*\*  
 ELEVATION DATA: UPSTREAM(FEET) = 700.00 DOWNSTREAM(FEET) = 661.95  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1622.36 CHANNEL SLOPE = 0.0235  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.02  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.381  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	129.79	0.30	0.897	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.897  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1201.79

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.20  
 AVERAGE FLOW DEPTH (FEET) = 3.02 TRAVEL TIME (MIN.) = 2.65  
 Tc (MIN.) = 45.97  
 SUBAREA AREA (ACRES) = 129.79 SUBAREA RUNOFF (CFS) = 129.93  
 EFFECTIVE AREA (ACRES) = 1238.35 AREA-AVERAGED Fm (INCH/HR) = 0.29  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA (ACRES) = 1301.2 PEAK FLOW RATE (CFS) = 1219.95  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 3.04

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 3.04 FLOW VELOCITY (FEET/SEC.) = 10.25  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13521.00 = 15868.75 FEET.

\*\* PEAK FLOW RATE TABLE \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1219.95	45.97	1.381	0.30 (0.29)	0.96	1238.4	13510.00
2	1128.64	53.78	1.250	0.30 (0.29)	0.95	1301.2	13500.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 1219.95 Tc (MIN.) = 45.97  
 AREA-AVERAGED Fm (INCH/HR) = 0.29 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.96 EFFECTIVE AREA (ACRES) = 1238.35

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13521.00 TO NODE 13522.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 661.95 DOWNSTREAM (FEET) = 632.19  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2746.01 CHANNEL SLOPE = 0.0108  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 3.99  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.284  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	278.60	0.30	0.905	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.905  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1346.90  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.09  
 AVERAGE FLOW DEPTH (FEET) = 3.97 TRAVEL TIME (MIN.) = 5.66  
 Tc (MIN.) = 51.63  
 SUBAREA AREA (ACRES) = 278.60 SUBAREA RUNOFF (CFS) = 253.89  
 EFFECTIVE AREA (ACRES) = 1516.95 AREA-AVERAGED Fm (INCH/HR) = 0.28  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.95  
 TOTAL AREA (ACRES) = 1579.8 PEAK FLOW RATE (CFS) = 1365.32  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 4.00

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 4.00 FLOW VELOCITY (FEET/SEC.) = 8.12  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13522.00 = 18614.76 FEET.

\*\* PEAK FLOW RATE TABLE \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1365.32	51.63	1.284	0.30 (0.28)	0.95	1517.0	13510.00
2	1241.92	59.58	1.157	0.30 (0.28)	0.94	1579.8	13500.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 1365.32 Tc (MIN.) = 51.63  
 AREA-AVERAGED Fm (INCH/HR) = 0.28 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA (ACRES) = 1516.95

=====

END OF STUDY SUMMARY:  
 TOTAL AREA (ACRES) = 1579.8 TC (MIN.) = 51.63  
 EFFECTIVE AREA (ACRES) = 1516.95 AREA-AVERAGED Fm (INCH/HR) = 0.28  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.947  
 PEAK FLOW RATE (CFS) = 1365.32

\*\* PEAK FLOW RATE TABLE \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1365.32	51.63	1.284	0.30 (0.28)	0.95	1517.0	13510.00
2	1241.92	59.58	1.157	0.30 (0.28)	0.94	1579.8	13500.00

=====

END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

Michael Baker International  
5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

-----  
FILE NAME: S36.DAT  
TIME/DATE OF STUDY: 08:15 07/16/2018  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.786
- 2) 10.00; 3.745
- 3) 15.00; 2.905
- 4) 20.00; 2.401
- 5) 25.00; 2.083
- 6) 30.00; 1.861
- 7) 40.00; 1.606
- 8) 50.00; 1.392
- 9) 60.00; 1.279
- 10) 90.00; 1.075
- 11) 120.00; 0.938
- 12) 180.00; 0.782
- 13) 360.00; 0.577
- 14) 1200.00; 0.251

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13600.00 TO NODE 13600.50 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 488.61  
ELEVATION DATA: UPSTREAM(FEET) = 872.12 DOWNSTREAM(FEET) = 744.80

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.995  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.578

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER						
"OPEN BRUSH"	-	3.39	0.30	1.000	0	11.00

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 10.00  
TOTAL AREA(ACRES) = 3.39 PEAK FLOW RATE(CFS) = 10.00

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13600.50 TO NODE 13601.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 744.80 DOWNSTREAM(FEET) = 707.32  
CHANNEL LENGTH THRU SUBAREA(FEET) = 418.30 CHANNEL SLOPE = 0.0896  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.46  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.289

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	7.45	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.04  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.06  
AVERAGE FLOW DEPTH(FEET) = 0.45 TRAVEL TIME(MIN.) = 1.72  
Tc(MIN.) = 12.71  
SUBAREA AREA(ACRES) = 7.45 SUBAREA RUNOFF(CFS) = 20.04  
EFFECTIVE AREA(ACRES) = 10.84 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 10.8 PEAK FLOW RATE(CFS) = 29.16  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.56

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.56 FLOW VELOCITY(FEET/SEC.) = 4.67  
LONGEST FLOWPATH FROM NODE 13600.00 TO NODE 13601.00 = 906.91 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13601.00 TO NODE 13602.00 IS CODE = 56



-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 707.32 DOWNSTREAM(FEET) = 657.12  
CHANNEL LENGTH THRU SUBAREA(FEET) = 777.60 CHANNEL SLOPE = 0.0646  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.03

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.899

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	30.96	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 65.46

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.53

AVERAGE FLOW DEPTH(FEET) = 0.99 TRAVEL TIME(MIN.) = 2.35

Tc(MIN.) = 15.06

SUBAREA AREA(ACRES) = 30.96 SUBAREA RUNOFF(CFS) = 72.42

EFFECTIVE AREA(ACRES) = 41.80 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 41.8 PEAK FLOW RATE(CFS) = 97.78

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.25

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.25 FLOW VELOCITY(FEET/SEC.) = 6.28

LONGEST FLOWPATH FROM NODE 13600.00 TO NODE 13602.00 = 1684.51 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13602.00 TO NODE 13603.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 657.12 DOWNSTREAM(FEET) = 584.58  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1186.54 CHANNEL SLOPE = 0.0611  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.45

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.598

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	23.36	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 121.96

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.62

AVERAGE FLOW DEPTH(FEET) = 1.43 TRAVEL TIME(MIN.) = 2.99

Tc(MIN.) = 18.04

SUBAREA AREA(ACRES) = 23.36 SUBAREA RUNOFF(CFS) = 48.32

EFFECTIVE AREA(ACRES) = 65.16 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 65.2 PEAK FLOW RATE(CFS) = 134.78

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.52

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.52 FLOW VELOCITY(FEET/SEC.) = 6.83

LONGEST FLOWPATH FROM NODE 13600.00 TO NODE 13603.00 = 2871.05 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13603.00 TO NODE 13620.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 584.58 DOWNSTREAM(FEET) = 544.91  
CHANNEL LENGTH THRU SUBAREA(FEET) = 860.98 CHANNEL SLOPE = 0.0461  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.78

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.384

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	21.24	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 154.70

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.44

AVERAGE FLOW DEPTH(FEET) = 1.77 TRAVEL TIME(MIN.) = 2.23

Tc(MIN.) = 20.27

SUBAREA AREA(ACRES) = 21.24 SUBAREA RUNOFF(CFS) = 39.83

EFFECTIVE AREA(ACRES) = 86.40 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 86.4 PEAK FLOW RATE(CFS) = 162.03

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.82

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.82 FLOW VELOCITY(FEET/SEC.) = 6.53

LONGEST FLOWPATH FROM NODE 13600.00 TO NODE 13620.00 = 3732.03 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13603.00 TO NODE 13620.00 IS CODE = 10

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

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13522.00 TO NODE 13522.00 IS CODE = 15.1

-----  
>>>>DEFINE MEMORY BANK # 2 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: S35.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap (ACRES)	Ae (ACRES)	HEADWATER NODE
1	1365.32	51.63	0.30( 0.28)	0.95	1517.0	13510.00

2 1241.92 59.58 0.30( 0.28) 0.94 1579.8 13500.00  
TOTAL AREA(ACRES) = 1579.8

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13522.00 TO NODE 13522.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1365.32	51.63	0.30( 0.28)	0.95	1517.0	13510.00
2	1241.92	59.58	0.30( 0.28)	0.94	1579.8	13500.00

TOTAL AREA(ACRES) = 1579.8

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13522.00 TO NODE 13523.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 632.19 DOWNSTREAM(FEET) = 561.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1151.68 CHANNEL SLOPE = 0.0618  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.47  
CHANNEL FLOW THRU SUBAREA(CFS) = 1365.32  
FLOW VELOCITY(FEET/SEC.) = 14.78 FLOW DEPTH(FEET) = 2.47  
TRAVEL TIME(MIN.) = 1.30 Tc(MIN.) = 52.92  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13523.00 = 19766.44 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1467.67	52.92	1.359	0.30( 0.28)	0.95	1517.0	13510.00
2	1406.88	60.92	1.273	0.30( 0.28)	0.94	1579.8	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1467.67 Tc(MIN.) = 52.92  
AREA-AVERAGED Fm(INCH/HR) = 0.28 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA(ACRES) = 1516.95

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13523.00 TO NODE 13523.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 2 <<<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13523.00 TO NODE 13523.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: 0610201Y.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	93.04	14.28	0.30( 0.30)	1.00	37.9	20100.00

TOTAL AREA(ACRES) = 37.9

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13523.00 TO NODE 13523.00 IS CODE = 11  
-----

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<<  
=====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1467.67	52.92	1.359	0.30( 0.28)	0.95	1517.0	13510.00
2	1406.88	60.92	1.273	0.30( 0.28)	0.94	1579.8	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13523.00 = 19766.44 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	93.04	14.28	3.026	0.30( 0.30)	1.00	37.9	20100.00

LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 13523.00 = 2767.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1103.14	14.28	3.026	0.30( 0.29)	0.95	447.3	20100.00
2	1503.81	52.92	1.359	0.30( 0.28)	0.95	1554.9	13510.00
3	1440.09	60.92	1.273	0.30( 0.28)	0.95	1617.8	13500.00

TOTAL AREA(ACRES) = 1617.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1503.81 Tc(MIN.) = 52.924  
EFFECTIVE AREA(ACRES) = 1554.89 AREA-AVERAGED Fm(INCH/HR) = 0.28  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.95  
TOTAL AREA(ACRES) = 1617.8  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13523.00 = 19766.44 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13523.00 TO NODE 13524.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 561.00 DOWNSTREAM(FEET) = 556.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 238.34 CHANNEL SLOPE = 0.0210  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.52  
CHANNEL FLOW THRU SUBAREA(CFS) = 1503.81  
FLOW VELOCITY(FEET/SEC.) = 10.53 FLOW DEPTH(FEET) = 3.52  
TRAVEL TIME(MIN.) = 0.38 Tc(MIN.) = 53.30  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13524.00 = 20004.78 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1103.14	14.70	2.956	0.30( 0.29)	0.95	447.3	20100.00
2	1503.81	53.30	1.355	0.30( 0.28)	0.95	1554.9	13510.00
3	1440.09	61.30	1.270	0.30( 0.28)	0.95	1617.8	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1503.81 Tc(MIN.) = 53.30  
 AREA-AVERAGED Fm(INCH/HR) = 0.28 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA(ACRES) = 1554.89

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13524.00 TO NODE 13524.00 IS CODE = 12  
 -----

>>>>CLEAR MEMORY BANK # 2 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13524.00 TO NODE 13524.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610202Y.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	76.85	13.00	0.30( 0.30)	1.00	29.0	20210.00
2	76.63	13.10	0.30( 0.30)	1.00	29.1	20200.00
TOTAL AREA(ACRES) =			29.1			

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13524.00 TO NODE 13524.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1103.14	14.70	2.956	0.30( 0.29)	0.95	447.3	20100.00
2	1503.81	53.30	1.355	0.30( 0.28)	0.95	1554.9	13510.00
3	1440.09	61.30	1.270	0.30( 0.28)	0.95	1617.8	13500.00
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13524.00 = 20004.78 FEET.							

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	76.85	13.00	3.241	0.30( 0.30)	1.00	29.0	20210.00
2	76.63	13.10	3.225	0.30( 0.30)	1.00	29.1	20200.00
LONGEST FLOWPATH FROM NODE 20210.00 TO NODE 13524.00 = 2247.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1156.72	13.00	3.241	0.30( 0.29)	0.95	424.6	20210.00
2	1158.62	13.10	3.225	0.30( 0.29)	0.95	427.7	20200.00
3	1172.72	14.70	2.956	0.30( 0.29)	0.95	476.4	20100.00
4	1531.45	53.30	1.355	0.30( 0.28)	0.95	1584.0	13510.00
5	1465.51	61.30	1.270	0.30( 0.28)	0.95	1646.9	13500.00
TOTAL AREA(ACRES) =			1646.9				

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1531.45 Tc(MIN.) = 53.302  
 EFFECTIVE AREA(ACRES) = 1584.00 AREA-AVERAGED Fm(INCH/HR) = 0.28

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.95  
 TOTAL AREA(ACRES) = 1646.9  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13524.00 = 20004.78 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13524.00 TO NODE 13620.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 556.00 DOWNSTREAM(FEET) = 544.91  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 672.93 CHANNEL SLOPE = 0.0165  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.82  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.342

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	27.94	0.30	0.884	-
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.884					
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1544.98					
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.76					
AVERAGE FLOW DEPTH(FEET) = 3.82 TRAVEL TIME(MIN.) = 1.15					
Tc(MIN.) = 54.45					
SUBAREA AREA(ACRES) = 27.94 SUBAREA RUNOFF(CFS) = 27.07					
EFFECTIVE AREA(ACRES) = 1611.94 AREA-AVERAGED Fm(INCH/HR) = 0.28					
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.95					
TOTAL AREA(ACRES) = 1674.8 PEAK FLOW RATE(CFS) = 1534.05					
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0					
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040					
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.80					

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.80 FLOW VELOCITY(FEET/SEC.) = 9.74  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13620.00 = 20677.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1156.72	14.24	3.032	0.30( 0.28)	0.95	452.5	20210.00
2	1158.62	14.34	3.016	0.30( 0.29)	0.95	455.7	20200.00
3	1172.72	15.94	2.811	0.30( 0.29)	0.95	504.3	20100.00
4	1534.05	54.45	1.342	0.30( 0.28)	0.95	1611.9	13510.00
5	1475.06	62.46	1.262	0.30( 0.28)	0.95	1674.8	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1534.05 Tc(MIN.) = 54.45  
 AREA-AVERAGED Fm(INCH/HR) = 0.28 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA(ACRES) = 1611.94

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13603.00 TO NODE 13620.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1156.72	14.24	3.032	0.30 ( 0.28)	0.95	452.5	20210.00
2	1158.62	14.34	3.016	0.30 ( 0.29)	0.95	455.7	20200.00
3	1172.72	15.94	2.811	0.30 ( 0.29)	0.95	504.3	20100.00
4	1534.05	54.45	1.342	0.30 ( 0.28)	0.95	1611.9	13510.00
5	1475.06	62.46	1.262	0.30 ( 0.28)	0.95	1674.8	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13620.00 = 20677.71 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	162.03	20.27	2.384	0.30 ( 0.30)	1.00	86.4	13600.00

LONGEST FLOWPATH FROM NODE 13600.00 TO NODE 13620.00 = 3732.03 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1305.99	14.24	3.032	0.30 ( 0.29)	0.96	513.2	20210.00
2	1308.02	14.34	3.016	0.30 ( 0.29)	0.96	516.8	20200.00
3	1326.20	15.94	2.811	0.30 ( 0.29)	0.96	572.3	20100.00
4	1375.42	20.27	2.384	0.30 ( 0.29)	0.96	715.4	13600.00
5	1615.06	54.45	1.342	0.30 ( 0.29)	0.95	1698.3	13510.00
6	1549.89	62.46	1.262	0.30 ( 0.28)	0.95	1761.2	13500.00

TOTAL AREA (ACRES) = 1761.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 1615.06 Tc (MIN.) = 54.451  
EFFECTIVE AREA (ACRES) = 1698.34 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
TOTAL AREA (ACRES) = 1761.2  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13620.00 = 20677.71 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13620.00 TO NODE 13621.00 IS CODE = 56  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 544.91 DOWNSTREAM (FEET) = 527.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 868.57 CHANNEL SLOPE = 0.0206  
GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 3.68  
CHANNEL FLOW THRU SUBAREA (CFS) = 1615.06  
FLOW VELOCITY (FEET/SEC.) = 10.69 FLOW DEPTH (FEET) = 3.68  
TRAVEL TIME (MIN.) = 1.35 Tc (MIN.) = 55.81  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13621.00 = 21546.28 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1305.99	15.69	2.836	0.30 ( 0.29)	0.96	513.2	20210.00
2	1308.02	15.79	2.826	0.30 ( 0.29)	0.96	516.8	20200.00
3	1326.20	17.37	2.666	0.30 ( 0.29)	0.96	572.3	20100.00
4	1375.42	21.69	2.293	0.30 ( 0.29)	0.96	715.4	13600.00
5	1615.06	55.81	1.326	0.30 ( 0.29)	0.95	1698.3	13510.00
6	1549.89	63.83	1.253	0.30 ( 0.28)	0.95	1761.2	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 1615.06 Tc (MIN.) = 55.81  
AREA-AVERAGED Fm (INCH/HR) = 0.29 AREA-AVERAGED Fp (INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA (ACRES) = 1698.34

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13621.00 TO NODE 13621.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1<<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13621.00 TO NODE 13621.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1<<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610203Y.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	71.29	13.31	0.30 ( 0.30)	1.00	27.4	20300.00

TOTAL AREA (ACRES) = 27.4

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13621.00 TO NODE 13621.00 IS CODE = 11  
-----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1305.99	15.69	2.836	0.30 ( 0.29)	0.96	513.2	20210.00
2	1308.02	15.79	2.826	0.30 ( 0.29)	0.96	516.8	20200.00
3	1326.20	17.37	2.666	0.30 ( 0.29)	0.96	572.3	20100.00
4	1375.42	21.69	2.293	0.30 ( 0.29)	0.96	715.4	13600.00
5	1615.06	55.81	1.326	0.30 ( 0.29)	0.95	1698.3	13510.00
6	1549.89	63.83	1.253	0.30 ( 0.28)	0.95	1761.2	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13621.00 = 21546.28 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	71.29	13.31	3.189	0.30 ( 0.30)	1.00	27.4	20300.00

LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 13621.00 = 2609.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1332.80	13.31	3.189	0.30 ( 0.29)	0.96	462.7	20300.00
2	1368.56	15.69	2.836	0.30 ( 0.29)	0.96	540.7	20210.00
3	1370.34	15.79	2.826	0.30 ( 0.29)	0.96	544.2	20200.00
4	1384.57	17.37	2.666	0.30 ( 0.29)	0.96	599.7	20100.00
5	1424.61	21.69	2.293	0.30 ( 0.29)	0.96	742.8	13600.00
6	1640.38	55.81	1.326	0.30 ( 0.29)	0.95	1725.8	13510.00
7	1573.41	63.83	1.253	0.30 ( 0.28)	0.95	1788.6	13500.00

TOTAL AREA (ACRES) = 1788.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1640.38 Tc(MIN.) = 55.806
EFFECTIVE AREA(ACRES) = 1725.77 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 1788.6
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13621.00 = 21546.28 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 13621.00 TO NODE 13622.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 527.00 DOWNSTREAM(FEET) = 512.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 56.08 CHANNEL SLOPE = 0.2675
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.81
CHANNEL FLOW THRU SUBAREA(CFS) = 1640.38
FLOW VELOCITY(FEET/SEC.) = 25.66 FLOW DEPTH(FEET) = 1.81
TRAVEL TIME(MIN.) = 0.04 Tc(MIN.) = 55.84
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13622.00 = 21602.36 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 7 rows of data.

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1640.38 Tc(MIN.) = 55.84
AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA(ACRES) = 1725.77

\*\*\*\*\*
FLOW PROCESS FROM NODE 13622.00 TO NODE 13622.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*
FLOW PROCESS FROM NODE 13622.00 TO NODE 13622.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610204Y.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 1 row of data and a total area calculation.

\*\*\*\*\*
FLOW PROCESS FROM NODE 13622.00 TO NODE 13622.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 7 rows of data and a longest flowpath calculation.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 1 row of data and a longest flowpath calculation.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 8 rows of data and a total area calculation.

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1670.07 Tc(MIN.) = 55.842
EFFECTIVE AREA(ACRES) = 1757.92 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 1820.8
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13622.00 = 21602.36 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 13622.00 TO NODE 13640.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 512.00 DOWNSTREAM(FEET) = 489.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 459.72 CHANNEL SLOPE = 0.0500
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.99
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.320
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 112.88 0.30 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1721.89  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.80  
 AVERAGE FLOW DEPTH(FEET) = 2.99 TRAVEL TIME(MIN.) = 0.52  
 Tc(MIN.) = 56.36  
 SUBAREA AREA(ACRES) = 112.88 SUBAREA RUNOFF(CFS) = 103.64  
 EFFECTIVE AREA(ACRES) = 1870.80 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA(ACRES) = 1933.7 PEAK FLOW RATE(CFS) = 1740.44  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.00

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.00 FLOW VELOCITY(FEET/SEC.) = 14.86  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13640.00 = 22062.08 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1533.88	13.51	3.155	0.30( 0.29)	0.97	595.0	20400.00
2	1533.08	13.88	3.093	0.30( 0.29)	0.97	607.8	20300.00
3	1535.28	16.26	2.778	0.30( 0.29)	0.97	685.7	20210.00
4	1537.18	16.36	2.768	0.30( 0.29)	0.97	689.2	20200.00
5	1553.77	17.95	2.608	0.30( 0.29)	0.97	744.7	20100.00
6	1572.32	22.26	2.257	0.30( 0.29)	0.96	887.9	13600.00
7	1740.44	56.36	1.320	0.30( 0.29)	0.96	1870.8	13510.00
8	1676.40	64.40	1.249	0.30( 0.29)	0.95	1933.7	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1740.44 Tc(MIN.) = 56.36  
 AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.96 EFFECTIVE AREA(ACRES) = 1870.80

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13640.00 TO NODE 13640.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610205Y.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23.44	11.26	0.30( 0.30)	1.00	8.1	20500.00
TOTAL AREA(ACRES) = 8.1						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13640.00 TO NODE 13640.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1533.88	13.51	3.155	0.30( 0.29)	0.97	595.0	20400.00
2	1533.08	13.88	3.093	0.30( 0.29)	0.97	607.8	20300.00
3	1535.28	16.26	2.778	0.30( 0.29)	0.97	685.7	20210.00

4	1537.18	16.36	2.768	0.30( 0.29)	0.97	689.2	20200.00
5	1553.77	17.95	2.608	0.30( 0.29)	0.97	744.7	20100.00
6	1572.32	22.26	2.257	0.30( 0.29)	0.96	887.9	13600.00
7	1740.44	56.36	1.320	0.30( 0.29)	0.96	1870.8	13510.00
8	1676.40	64.40	1.249	0.30( 0.29)	0.95	1933.7	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13640.00 = 22062.08 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23.44	11.26	3.534	0.30( 0.30)	1.00	8.1	20500.00
LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 13640.00 = 1025.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1470.45	11.26	3.534	0.30( 0.29)	0.97	503.8	20500.00
2	1554.58	13.51	3.155	0.30( 0.29)	0.97	603.0	20400.00
3	1553.33	13.88	3.093	0.30( 0.29)	0.97	615.8	20300.00
4	1553.25	16.26	2.778	0.30( 0.29)	0.97	693.8	20210.00
5	1555.07	16.36	2.768	0.30( 0.29)	0.97	697.3	20200.00
6	1570.51	17.95	2.608	0.30( 0.29)	0.97	752.8	20100.00
7	1586.50	22.26	2.257	0.30( 0.29)	0.96	895.9	13600.00
8	1747.83	56.36	1.320	0.30( 0.29)	0.96	1878.9	13510.00
9	1683.28	64.40	1.249	0.30( 0.29)	0.95	1941.7	13500.00
TOTAL AREA(ACRES) = 1941.7							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1747.83 Tc(MIN.) = 56.360  
 EFFECTIVE AREA(ACRES) = 1878.86 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA(ACRES) = 1941.7  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13640.00 = 22062.08 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13640.00 TO NODE 13641.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 489.00 DOWNSTREAM(FEET) = 436.89  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2992.90 CHANNEL SLOPE = 0.0174  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.13  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.271

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	180.31	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1826.65

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.46

AVERAGE FLOW DEPTH(FEET) = 4.12 TRAVEL TIME(MIN.) = 4.77

Tc(MIN.) = 61.13

SUBAREA AREA(ACRES) = 180.31 SUBAREA RUNOFF(CFS) = 157.64

EFFECTIVE AREA(ACRES) = 2059.17 AREA-AVERAGED Fm(INCH/HR) = 0.29

AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA (ACRES) = 2122.0 PEAK FLOW RATE (CFS) = 1822.92  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 4.12

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 4.12 FLOW VELOCITY (FEET/SEC.) = 10.45  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13641.00 = 25054.98 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1536.24	16.16	2.788	0.30 ( 0.29)	0.98	684.1	20500.00
2	1603.14	18.36	2.567	0.30 ( 0.29)	0.98	783.3	20400.00
3	1602.79	18.72	2.530	0.30 ( 0.29)	0.98	796.1	20300.00
4	1602.92	21.12	2.330	0.30 ( 0.29)	0.97	874.1	20210.00
5	1604.77	21.21	2.324	0.30 ( 0.29)	0.97	877.6	20200.00
6	1621.63	22.80	2.223	0.30 ( 0.29)	0.97	933.1	20100.00
7	1644.47	27.12	1.989	0.30 ( 0.29)	0.97	1076.2	13600.00
8	1822.92	61.13	1.271	0.30 ( 0.29)	0.96	2059.2	13510.00
9	1774.62	69.22	1.216	0.30 ( 0.29)	0.96	2122.0	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 1822.92 Tc (MIN.) = 61.13  
 AREA-AVERAGED Fm (INCH/HR) = 0.29 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.96 EFFECTIVE AREA (ACRES) = 2059.17

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13641.00 TO NODE 13642.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 436.89 DOWNSTREAM (FEET) = 394.80  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2814.16 CHANNEL SLOPE = 0.0150  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 4.54  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.240

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	451.39	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2013.90  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.20  
 AVERAGE FLOW DEPTH (FEET) = 4.53 TRAVEL TIME (MIN.) = 4.60  
 Tc (MIN.) = 65.73

SUBAREA AREA (ACRES) = 451.39 SUBAREA RUNOFF (CFS) = 381.93  
 EFFECTIVE AREA (ACRES) = 2510.56 AREA-AVERAGED Fm (INCH/HR) = 0.29  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA (ACRES) = 2573.4 PEAK FLOW RATE (CFS) = 2146.91  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 4.69

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 4.69 FLOW VELOCITY (FEET/SEC.) = 10.40  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13642.00 = 27869.14 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2099.77	20.79	2.350	0.30 ( 0.30)	0.99	1135.5	20500.00
2	2129.96	22.97	2.212	0.30 ( 0.30)	0.98	1234.7	20400.00
3	2125.70	23.34	2.189	0.30 ( 0.30)	0.98	1247.5	20300.00
4	2093.28	25.75	2.050	0.30 ( 0.29)	0.98	1325.5	20210.00
5	2094.08	25.84	2.046	0.30 ( 0.29)	0.98	1329.0	20200.00
6	2093.91	27.43	1.975	0.30 ( 0.29)	0.98	1384.5	20100.00
7	2093.17	31.76	1.816	0.30 ( 0.29)	0.98	1527.6	13600.00
8	2146.91	65.73	1.240	0.30 ( 0.29)	0.97	2510.6	13510.00
9	2073.79	73.86	1.185	0.30 ( 0.29)	0.96	2573.4	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 2146.91 Tc (MIN.) = 65.73  
 AREA-AVERAGED Fm (INCH/HR) = 0.29 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA (ACRES) = 2510.56

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13642.00 TO NODE 13643.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 394.80 DOWNSTREAM (FEET) = 342.39  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2913.57 CHANNEL SLOPE = 0.0180  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 4.66  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.211

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	434.58	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2325.08  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.36  
 AVERAGE FLOW DEPTH (FEET) = 4.66 TRAVEL TIME (MIN.) = 4.28  
 Tc (MIN.) = 70.00

SUBAREA AREA (ACRES) = 434.58 SUBAREA RUNOFF (CFS) = 356.33  
 EFFECTIVE AREA (ACRES) = 2945.14 AREA-AVERAGED Fm (INCH/HR) = 0.29  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA (ACRES) = 3008.0 PEAK FLOW RATE (CFS) = 2437.53  
 GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 4.77

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 4.77 FLOW VELOCITY (FEET/SEC.) = 11.52  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13643.00 = 30782.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2523.51	25.01	2.083	0.30 ( 0.30)	0.99	1570.1	20500.00

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2 2538.98 27.17 1.987 0.30( 0.30) 0.99 1669.3 20400.00
3 2533.40 27.55 1.970 0.30( 0.30) 0.99 1682.1 20300.00
4 2479.77 29.99 1.862 0.30( 0.30) 0.99 1760.0 20210.00
5 2480.75 30.08 1.859 0.30( 0.30) 0.99 1763.6 20200.00
6 2492.63 31.67 1.818 0.30( 0.30) 0.99 1819.1 20100.00
7 2494.73 36.01 1.708 0.30( 0.30) 0.98 1962.2 13600.00
8 2437.53 70.00 1.211 0.30( 0.29) 0.97 2945.1 13510.00
9 2340.28 78.19 1.155 0.30( 0.29) 0.97 3008.0 13500.00

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NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 2538.98 Tc(MIN.) = 27.17
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 1669.30

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*****
FLOW PROCESS FROM NODE 13643.00 TO NODE 13660.00 IS CODE = 56

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 342.39 DOWNSTREAM(FEET) = 300.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1591.23 CHANNEL SLOPE = 0.0266
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 4.47
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.899

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SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 109.24 0.30 1.000 -

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SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2617.61
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.51
AVERAGE FLOW DEPTH(FEET) = 4.47 TRAVEL TIME(MIN.) = 1.96
Tc(MIN.) = 29.14
SUBAREA AREA(ACRES) = 109.24 SUBAREA RUNOFF(CFS) = 157.25
EFFECTIVE AREA(ACRES) = 1778.54 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 3117.3 PEAK FLOW RATE(CFS) = 2565.24
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040
*ESTIMATED CHANNEL HEIGHT(FEET) = 4.41

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 4.41 FLOW VELOCITY(FEET/SEC.) = 13.44
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13660.00 = 32373.94 FEET.

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** PEAK FLOW RATE TABLE **

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STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2566.99	26.97	1.996	0.30( 0.30)	0.99	1679.3	20500.00
2	2565.24	29.14	1.899	0.30( 0.30)	0.99	1778.5	20400.00
3	2556.99	29.51	1.883	0.30( 0.30)	0.99	1791.4	20300.00
4	2548.10	31.96	1.811	0.30( 0.30)	0.99	1869.3	20210.00
5	2549.06	32.05	1.809	0.30( 0.30)	0.99	1872.8	20200.00
6	2554.56	33.65	1.768	0.30( 0.30)	0.99	1928.3	20100.00
7	2539.23	37.98	1.657	0.30( 0.30)	0.98	2071.4	13600.00
8	2489.83	72.00	1.197	0.30( 0.29)	0.97	3054.4	13510.00

```

9 2385.85 80.21 1.142 0.30( 0.29) 0.97 3117.3 13500.00
NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 2566.99 Tc(MIN.) = 26.97
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 1679.35

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*****
FLOW PROCESS FROM NODE 13643.00 TO NODE 13660.00 IS CODE = 12

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>>>>CLEAR MEMORY BANK # 1 <<<<

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*****
FLOW PROCESS FROM NODE 13660.00 TO NODE 13660.00 IS CODE = 15.1

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>>>>DEFINE MEMORY BANK # 1 <<<<

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PEAK FLOWRATE TABLE FILE NAME: 0610206Y.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:
STREAM Q Tc Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 332.25 21.83 0.30( 0.30) 1.00 186.0 20600.00
TOTAL AREA(ACRES) = 186.0

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*****
FLOW PROCESS FROM NODE 13660.00 TO NODE 13660.00 IS CODE = 11

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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<

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** MAIN STREAM CONFLUENCE DATA **

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STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2566.99	26.97	1.996	0.30( 0.30)	0.99	1679.3	20500.00
2	2565.24	29.14	1.899	0.30( 0.30)	0.99	1778.5	20400.00
3	2556.99	29.51	1.883	0.30( 0.30)	0.99	1791.4	20300.00
4	2548.10	31.96	1.811	0.30( 0.30)	0.99	1869.3	20210.00
5	2549.06	32.05	1.809	0.30( 0.30)	0.99	1872.8	20200.00
6	2554.56	33.65	1.768	0.30( 0.30)	0.99	1928.3	20100.00
7	2539.23	37.98	1.657	0.30( 0.30)	0.98	2071.4	13600.00
8	2489.83	72.00	1.197	0.30( 0.29)	0.97	3054.4	13510.00
9	2385.85	80.21	1.142	0.30( 0.29)	0.97	3117.3	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13660.00 = 32373.94 FEET.

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** MEMORY BANK # 1 CONFLUENCE DATA **

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STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	332.25	21.83	2.285	0.30( 0.30)	1.00	186.0	20600.00

LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 13660.00 = 6967.00 FEET.

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** PEAK FLOW RATE TABLE **

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STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2763.62	21.83	2.285	0.30( 0.30)	0.99	1545.2	20600.00
2	2850.83	26.97	1.996	0.30( 0.30)	0.99	1865.4	20500.00
3	2832.98	29.14	1.899	0.30( 0.30)	0.99	1964.6	20400.00
4	2821.95	29.51	1.883	0.30( 0.30)	0.99	1977.4	20300.00
5	2801.03	31.96	1.811	0.30( 0.30)	0.99	2055.3	20210.00



6	2801.60	32.05	1.809	0.30	( 0.30)	0.99	2058.8	20200.00
7	2800.30	33.65	1.768	0.30	( 0.30)	0.99	2114.3	20100.00
8	2766.46	37.98	1.657	0.30	( 0.30)	0.99	2257.5	13600.00
9	2640.06	72.00	1.197	0.30	( 0.29)	0.97	3240.4	13510.00
10	2526.74	80.21	1.142	0.30	( 0.29)	0.97	3303.3	13500.00

TOTAL AREA (ACRES) = 3303.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 2850.83 Tc (MIN.) = 26.969  
EFFECTIVE AREA (ACRES) = 1865.38 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 3303.3  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13660.00 = 32373.94 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13660.00 TO NODE 13680.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 300.00 DOWNSTREAM (FEET) = 288.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 933.89 CHANNEL SLOPE = 0.0128  
GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.72  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.931

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	61.43	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2895.93  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.74  
AVERAGE FLOW DEPTH (FEET) = 5.72 TRAVEL TIME (MIN.) = 1.45  
Tc (MIN.) = 28.42  
SUBAREA AREA (ACRES) = 61.43 SUBAREA RUNOFF (CFS) = 90.19  
EFFECTIVE AREA (ACRES) = 1926.81 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 3364.7 PEAK FLOW RATE (CFS) = 2850.83  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.67

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 5.67 FLOW VELOCITY (FEET/SEC.) = 10.69  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13680.00 = 33307.83 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2763.62	23.29	2.192	0.30 ( 0.30)	0.99	1606.6	20600.00
2	2850.83	28.42	1.931	0.30 ( 0.30)	0.99	1926.8	20500.00
3	2832.98	30.59	1.846	0.30 ( 0.30)	0.99	2026.0	20400.00
4	2824.48	30.96	1.836	0.30 ( 0.30)	0.99	2038.8	20300.00
5	2813.89	33.42	1.774	0.30 ( 0.30)	0.99	2116.7	20210.00
6	2814.14	33.51	1.771	0.30 ( 0.30)	0.99	2120.3	20200.00

7	2808.77	35.10	1.731	0.30	( 0.30)	0.99	2175.8	20100.00
8	2766.46	39.45	1.620	0.30	( 0.30)	0.99	2318.9	13600.00
9	2659.72	73.48	1.187	0.30	( 0.29)	0.97	3301.8	13510.00
10	2542.36	81.71	1.131	0.30	( 0.29)	0.97	3364.7	13500.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE (CFS) = 2850.83 Tc (MIN.) = 28.42  
AREA-AVERAGED Fm (INCH/HR) = 0.30 AREA-AVERAGED Fp (INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA (ACRES) = 1926.81

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13660.00 TO NODE 13680.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13680.00 TO NODE 13680.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<

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PEAK FLOWRATE TABLE FILE NAME: 0610207Y.DNA  
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	399.35	15.84	0.30 ( 0.28)	0.92	174.5	20700.00

TOTAL AREA (ACRES) = 174.5

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13680.00 TO NODE 13680.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2763.62	23.29	2.192	0.30 ( 0.30)	0.99	1606.6	20600.00
2	2850.83	28.42	1.931	0.30 ( 0.30)	0.99	1926.8	20500.00
3	2832.98	30.59	1.846	0.30 ( 0.30)	0.99	2026.0	20400.00
4	2824.48	30.96	1.836	0.30 ( 0.30)	0.99	2038.8	20300.00
5	2813.89	33.42	1.774	0.30 ( 0.30)	0.99	2116.7	20210.00
6	2814.14	33.51	1.771	0.30 ( 0.30)	0.99	2120.3	20200.00
7	2808.77	35.10	1.731	0.30 ( 0.30)	0.99	2175.8	20100.00
8	2766.46	39.45	1.620	0.30 ( 0.30)	0.99	2318.9	13600.00
9	2659.72	73.48	1.187	0.30 ( 0.29)	0.97	3301.8	13510.00
10	2542.36	81.71	1.131	0.30 ( 0.29)	0.97	3364.7	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13680.00 = 33307.83 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	399.35	15.84	2.820	0.30 ( 0.28)	0.92	174.5	20700.00

LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 13680.00 = 6221.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2902.69	15.84	2.820	0.30 ( 0.29)	0.98	1267.3	20700.00

2	3064.29	23.29	2.192	0.30	( 0.30)	0.99	1781.2	20600.00
3	3110.57	28.42	1.931	0.30	( 0.30)	0.99	2101.3	20500.00
4	3079.34	30.59	1.846	0.30	( 0.30)	0.99	2200.5	20400.00
5	3069.33	30.96	1.836	0.30	( 0.30)	0.99	2213.3	20300.00
6	3048.91	33.42	1.774	0.30	( 0.30)	0.98	2291.2	20210.00
7	3048.79	33.51	1.771	0.30	( 0.30)	0.98	2294.8	20200.00
8	3037.05	35.10	1.731	0.30	( 0.30)	0.98	2350.3	20100.00
9	2977.35	39.45	1.620	0.30	( 0.29)	0.98	2493.4	13600.00
10	2802.65	73.48	1.187	0.30	( 0.29)	0.97	3476.3	13510.00
11	2676.51	81.71	1.131	0.30	( 0.29)	0.97	3539.2	13500.00

TOTAL AREA (ACRES) = 3539.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 3110.57 Tc (MIN.) = 28.418  
EFFECTIVE AREA (ACRES) = 2101.31 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 3539.2  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13680.00 = 33307.83 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13680.00 TO NODE 13682.00 IS CODE = 56  
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>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>> TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 288.00 DOWNSTREAM (FEET) = 242.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2860.77 CHANNEL SLOPE = 0.0161  
GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
\* ESTIMATED CHANNEL HEIGHT (FEET) = 5.67  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.800  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	112.53	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 3186.52  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.97  
AVERAGE FLOW DEPTH (FEET) = 5.67 TRAVEL TIME (MIN.) = 3.98  
Tc (MIN.) = 32.40

SUBAREA AREA (ACRES) = 112.53 SUBAREA RUNOFF (CFS) = 151.90  
EFFECTIVE AREA (ACRES) = 2213.84 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 3651.8 PEAK FLOW RATE (CFS) = 3110.57  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
\* ESTIMATED CHANNEL HEIGHT (FEET) = 5.60

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 5.60 FLOW VELOCITY (FEET/SEC.) = 11.88  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.00 = 36168.60 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2902.69	19.89	2.412	0.30 ( 0.30)	0.98	1379.8	20700.00

2	3064.29	27.29	1.981	0.30	( 0.30)	0.99	1893.7	20600.00
3	3110.57	32.40	1.800	0.30	( 0.30)	0.99	2213.8	20500.00
4	3079.34	34.59	1.744	0.30	( 0.30)	0.99	2313.0	20400.00
5	3069.33	34.97	1.734	0.30	( 0.30)	0.99	2325.8	20300.00
6	3048.91	37.43	1.672	0.30	( 0.30)	0.99	2403.8	20210.00
7	3048.79	37.52	1.669	0.30	( 0.30)	0.99	2407.3	20200.00
8	3037.05	39.12	1.628	0.30	( 0.30)	0.98	2462.8	20100.00
9	2977.35	43.49	1.531	0.30	( 0.29)	0.98	2605.9	13600.00
10	2802.65	77.60	1.159	0.30	( 0.29)	0.97	3588.9	13510.00
11	2676.51	85.88	1.103	0.30	( 0.29)	0.97	3651.8	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 3110.57 Tc (MIN.) = 32.40  
AREA-AVERAGED Fm (INCH/HR) = 0.30 AREA-AVERAGED Fp (INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA (ACRES) = 2213.84

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13680.00 TO NODE 13682.00 IS CODE = 12  
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>>>> CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13682.00 TO NODE 13682.00 IS CODE = 15.1  
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>>>> DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610208Y.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	389.71	15.42	0.30 ( 0.30)	0.99		168.9	20810.00
2	381.17	18.24	0.30 ( 0.30)	0.99		185.8	20800.00

TOTAL AREA (ACRES) = 185.8

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13682.00 TO NODE 13682.00 IS CODE = 11  
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>>>> CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2902.69	19.89	2.412	0.30 ( 0.30)	0.98	1379.8	20700.00
2	3064.29	27.29	1.981	0.30 ( 0.30)	0.99	1893.7	20600.00
3	3110.57	32.40	1.800	0.30 ( 0.30)	0.99	2213.8	20500.00
4	3079.34	34.59	1.744	0.30 ( 0.30)	0.99	2313.0	20400.00
5	3069.33	34.97	1.734	0.30 ( 0.30)	0.99	2325.8	20300.00
6	3048.91	37.43	1.672	0.30 ( 0.30)	0.99	2403.8	20210.00
7	3048.79	37.52	1.669	0.30 ( 0.30)	0.99	2407.3	20200.00
8	3037.05	39.12	1.628	0.30 ( 0.30)	0.98	2462.8	20100.00
9	2977.35	43.49	1.531	0.30 ( 0.29)	0.98	2605.9	13600.00
10	2802.65	77.60	1.159	0.30 ( 0.29)	0.97	3588.9	13510.00
11	2676.51	85.88	1.103	0.30 ( 0.29)	0.97	3651.8	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.00 = 36168.60 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM	Q	Tc	Intensity	Fp (Fm)	Ap	Ae	HEADWATER
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NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE
1	389.71	15.42	2.863	0.30( 0.30)	0.99	168.9 20810.00
2	381.17	18.24	2.578	0.30( 0.30)	0.99	185.8 20800.00

LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 13682.00 = 5285.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3119.12	15.42	2.863	0.30( 0.30)	0.99	1238.7	20810.00
2	3252.28	18.24	2.578	0.30( 0.30)	0.99	1451.4	20800.00
3	3256.11	19.89	2.412	0.30( 0.30)	0.99	1565.6	20700.00
4	3345.68	27.29	1.981	0.30( 0.30)	0.99	2079.5	20600.00
5	3361.59	32.40	1.800	0.30( 0.30)	0.99	2399.7	20500.00
6	3321.05	34.59	1.744	0.30( 0.30)	0.99	2498.8	20400.00
7	3309.41	34.97	1.734	0.30( 0.30)	0.99	2511.7	20300.00
8	3278.50	37.43	1.672	0.30( 0.30)	0.99	2589.6	20210.00
9	3277.98	37.52	1.669	0.30( 0.30)	0.99	2593.1	20200.00
10	3259.43	39.12	1.628	0.30( 0.30)	0.99	2648.6	20100.00
11	3183.50	43.49	1.531	0.30( 0.30)	0.98	2791.7	13600.00
12	2946.59	77.60	1.159	0.30( 0.29)	0.97	3774.7	13510.00
13	2811.03	85.88	1.103	0.30( 0.29)	0.97	3837.6	13500.00

TOTAL AREA (ACRES) = 3837.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 3361.59 Tc (MIN.) = 32.402  
EFFECTIVE AREA (ACRES) = 2399.66 AREA-AVERAGED Fm (INCH/HR) = 0.30  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 3837.6  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.00 = 36168.60 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13682.00 TO NODE 13682.50 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 242.00 DOWNSTREAM (FEET) = 230.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 660.20 CHANNEL SLOPE = 0.0182  
GIVEN CHANNEL BASE (FEET) = 30.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.64  
CHANNEL FLOW THRU SUBAREA (CFS) = 3361.59  
FLOW VELOCITY (FEET/SEC.) = 12.69 FLOW DEPTH (FEET) = 5.64  
TRAVEL TIME (MIN.) = 0.87 Tc (MIN.) = 33.27  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.50 = 36828.80 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3119.12	16.31	2.773	0.30( 0.30)	0.99	1238.7	20810.00
2	3252.28	19.12	2.490	0.30( 0.30)	0.99	1451.4	20800.00
3	3256.11	20.76	2.352	0.30( 0.30)	0.99	1565.6	20700.00
4	3345.68	28.16	1.943	0.30( 0.30)	0.99	2079.5	20600.00
5	3361.59	33.27	1.778	0.30( 0.30)	0.99	2399.7	20500.00
6	3321.05	35.46	1.722	0.30( 0.30)	0.99	2498.8	20400.00
7	3309.41	35.84	1.712	0.30( 0.30)	0.99	2511.7	20300.00
8	3278.50	38.30	1.649	0.30( 0.30)	0.99	2589.6	20210.00
9	3277.98	38.40	1.647	0.30( 0.30)	0.99	2593.1	20200.00

10	3259.43	39.99	1.606	0.30( 0.30)	0.99	2648.6	20100.00
11	3183.50	44.37	1.513	0.30( 0.30)	0.98	2791.7	13600.00
12	2946.59	78.50	1.153	0.30( 0.29)	0.97	3774.7	13510.00
13	2811.03	86.80	1.097	0.30( 0.29)	0.97	3837.6	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 3361.59 Tc (MIN.) = 33.27  
AREA-AVERAGED Fm (INCH/HR) = 0.30 AREA-AVERAGED Fp (INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA (ACRES) = 2399.66

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13682.50 TO NODE 13682.50 IS CODE = 12

>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13682.50 TO NODE 13682.50 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610209Y.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	168.64	16.62	0.30( 0.30)	1.00	76.8	20900.00

TOTAL AREA (ACRES) = 76.8

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13682.50 TO NODE 13682.50 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3119.12	16.31	2.773	0.30( 0.30)	0.99	1238.7	20810.00
2	3252.28	19.12	2.490	0.30( 0.30)	0.99	1451.4	20800.00
3	3256.11	20.76	2.352	0.30( 0.30)	0.99	1565.6	20700.00
4	3345.68	28.16	1.943	0.30( 0.30)	0.99	2079.5	20600.00
5	3361.59	33.27	1.778	0.30( 0.30)	0.99	2399.7	20500.00
6	3321.05	35.46	1.722	0.30( 0.30)	0.99	2498.8	20400.00
7	3309.41	35.84	1.712	0.30( 0.30)	0.99	2511.7	20300.00
8	3278.50	38.30	1.649	0.30( 0.30)	0.99	2589.6	20210.00
9	3277.98	38.40	1.647	0.30( 0.30)	0.99	2593.1	20200.00
10	3259.43	39.99	1.606	0.30( 0.30)	0.99	2648.6	20100.00
11	3183.50	44.37	1.513	0.30( 0.30)	0.98	2791.7	13600.00
12	2946.59	78.50	1.153	0.30( 0.29)	0.97	3774.7	13510.00
13	2811.03	86.80	1.097	0.30( 0.29)	0.97	3837.6	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.50 = 36828.80 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	168.64	16.62	2.742	0.30( 0.30)	1.00	76.8	20900.00

LONGEST FLOWPATH FROM NODE 20900.00 TO NODE 13682.50 = 4089.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3286.72	16.31	2.773	0.30( 0.30)	0.99	1314.1	20810.00
2	3302.54	16.62	2.742	0.30( 0.30)	0.99	1339.1	20900.00
3	3403.52	19.12	2.490	0.30( 0.30)	0.99	1528.1	20800.00
4	3397.85	20.76	2.352	0.30( 0.30)	0.99	1642.4	20700.00
5	3459.14	28.16	1.943	0.30( 0.30)	0.99	2156.3	20600.00
6	3463.64	33.27	1.778	0.30( 0.30)	0.99	2476.4	20500.00
7	3419.25	35.46	1.722	0.30( 0.30)	0.99	2575.6	20400.00
8	3406.94	35.84	1.712	0.30( 0.30)	0.99	2588.4	20300.00
9	3371.69	38.30	1.649	0.30( 0.30)	0.99	2666.3	20210.00
10	3371.00	38.40	1.647	0.30( 0.30)	0.99	2669.9	20200.00
11	3349.64	39.99	1.606	0.30( 0.30)	0.99	2725.4	20100.00
12	3267.25	44.37	1.513	0.30( 0.30)	0.98	2868.5	13600.00
13	3005.52	78.50	1.153	0.30( 0.29)	0.97	3851.4	13510.00
14	2866.06	86.80	1.097	0.30( 0.29)	0.97	3914.3	13500.00
TOTAL AREA (ACRES) =							3914.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 3463.64 Tc(MIN.) = 33.269  
EFFECTIVE AREA(ACRES) = 2476.41 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 3914.3  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.50 = 36828.80 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13682.50 TO NODE 13683.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 230.00 DOWNSTREAM(FEET) = 208.53

CHANNEL LENGTH THRU SUBAREA(FEET) = 1866.20 CHANNEL SLOPE = 0.0115

GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.50

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.705

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	62.32	0.30	1.000	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3503.04

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.90

AVERAGE FLOW DEPTH(FEET) = 6.50 TRAVEL TIME(MIN.) = 2.85

Tc(MIN.) = 36.12

SUBAREA AREA(ACRES) = 62.32 SUBAREA RUNOFF(CFS) = 78.80

EFFECTIVE AREA(ACRES) = 2538.73 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99

TOTAL AREA(ACRES) = 3976.6 PEAK FLOW RATE(CFS) = 3463.64

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT(FEET) = 6.46

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 6.46 FLOW VELOCITY(FEET/SEC.) = 10.86

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13683.00 = 38695.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3286.72	19.20	2.482	0.30( 0.30)	0.99	1376.4	20810.00
2	3302.54	19.51	2.451	0.30( 0.30)	0.99	1401.4	20900.00
3	3403.52	21.98	2.275	0.30( 0.30)	0.99	1590.5	20800.00
4	3397.85	23.63	2.170	0.30( 0.30)	0.99	1704.7	20700.00
5	3459.14	31.01	1.835	0.30( 0.30)	0.99	2218.6	20600.00
6	3463.64	36.12	1.705	0.30( 0.30)	0.99	2538.7	20500.00
7	3419.25	38.32	1.649	0.30( 0.30)	0.99	2637.9	20400.00
8	3406.94	38.71	1.639	0.30( 0.30)	0.99	2650.7	20300.00
9	3371.69	41.18	1.581	0.30( 0.30)	0.99	2728.7	20210.00
10	3371.00	41.27	1.579	0.30( 0.30)	0.99	2732.2	20200.00
11	3349.64	42.87	1.544	0.30( 0.30)	0.99	2787.7	20100.00
12	3267.25	47.27	1.450	0.30( 0.30)	0.98	2930.8	13600.00
13	3005.52	81.48	1.133	0.30( 0.29)	0.97	3913.8	13510.00
14	2866.06	89.81	1.076	0.30( 0.29)	0.97	3976.6	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 3463.64 Tc(MIN.) = 36.12  
AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 2538.73

\*\*\*\*\*

FLOW PROCESS FROM NODE 13683.00 TO NODE 13684.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 208.53 DOWNSTREAM(FEET) = 200.00

CHANNEL LENGTH THRU SUBAREA(FEET) = 166.32 CHANNEL SLOPE = 0.0513

GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT(FEET) = 4.35

CHANNEL FLOW THRU SUBAREA(CFS) = 3463.64

FLOW VELOCITY(FEET/SEC.) = 18.49 FLOW DEPTH(FEET) = 4.35

TRAVEL TIME(MIN.) = 0.15 Tc(MIN.) = 36.27

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13684.00 = 38861.32 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3286.72	19.35	2.467	0.30( 0.30)	0.99	1376.4	20810.00
2	3302.54	19.66	2.435	0.30( 0.30)	0.99	1401.4	20900.00
3	3403.52	22.13	2.265	0.30( 0.30)	0.99	1590.5	20800.00
4	3397.85	23.78	2.161	0.30( 0.30)	0.99	1704.7	20700.00
5	3459.14	31.16	1.831	0.30( 0.30)	0.99	2218.6	20600.00
6	3463.64	36.27	1.701	0.30( 0.30)	0.99	2538.7	20500.00
7	3419.25	38.47	1.645	0.30( 0.30)	0.99	2637.9	20400.00
8	3406.94	38.86	1.635	0.30( 0.30)	0.99	2650.7	20300.00
9	3371.69	41.33	1.578	0.30( 0.30)	0.99	2728.7	20210.00
10	3371.00	41.42	1.576	0.30( 0.30)	0.99	2732.2	20200.00
11	3349.64	43.03	1.541	0.30( 0.30)	0.99	2787.7	20100.00
12	3267.25	47.42	1.447	0.30( 0.30)	0.98	2930.8	13600.00
13	3005.52	81.63	1.132	0.30( 0.29)	0.97	3913.8	13510.00
14	2866.06	89.97	1.075	0.30( 0.29)	0.97	3976.6	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 3463.64 Tc(MIN.) = 36.27  
 AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 2538.73

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13684.00 TO NODE 13684.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 3 <<<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13684.00 TO NODE 13684.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610210Y.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	180.67	16.76	0.30( 0.30)	1.00	82.7	21000.00
TOTAL AREA(ACRES) = 82.7						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13684.00 TO NODE 13684.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3286.72	19.35	2.467	0.30( 0.30)	0.99	1376.4	20810.00
2	3302.54	19.66	2.435	0.30( 0.30)	0.99	1401.4	20900.00
3	3403.52	22.13	2.265	0.30( 0.30)	0.99	1590.5	20800.00
4	3397.85	23.78	2.161	0.30( 0.30)	0.99	1704.7	20700.00
5	3459.14	31.16	1.831	0.30( 0.30)	0.99	2218.6	20600.00
6	3463.64	36.27	1.701	0.30( 0.30)	0.99	2538.7	20500.00
7	3419.25	38.47	1.645	0.30( 0.30)	0.99	2637.9	20400.00
8	3406.94	38.86	1.635	0.30( 0.30)	0.99	2650.7	20300.00
9	3371.69	41.33	1.578	0.30( 0.30)	0.99	2728.7	20210.00
10	3371.00	41.42	1.576	0.30( 0.30)	0.99	2732.2	20200.00
11	3349.64	43.03	1.541	0.30( 0.30)	0.99	2787.7	20100.00
12	3267.25	47.42	1.447	0.30( 0.30)	0.98	2930.8	13600.00
13	3005.52	81.63	1.132	0.30( 0.29)	0.97	3913.8	13510.00
14	2866.06	89.97	1.075	0.30( 0.29)	0.97	3976.6	13500.00
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13684.00 = 38861.32 FEET.							

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	180.67	16.76	2.728	0.30( 0.30)	1.00	82.7	21000.00
LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 13684.00 = 4160.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3369.82	16.76	2.728	0.30( 0.30)	0.99	1274.8	21000.00
2	3447.96	19.35	2.467	0.30( 0.30)	0.99	1459.1	20810.00

3	3461.47	19.66	2.435	0.30( 0.30)	0.99	1484.1	20900.00
4	3549.79	22.13	2.265	0.30( 0.30)	0.99	1673.2	20800.00
5	3536.32	23.78	2.161	0.30( 0.30)	0.99	1787.4	20700.00
6	3573.11	31.16	1.831	0.30( 0.30)	0.99	2301.3	20600.00
7	3567.91	36.27	1.701	0.30( 0.30)	0.99	2621.4	20500.00
8	3519.35	38.47	1.645	0.30( 0.30)	0.99	2720.6	20400.00
9	3506.31	38.86	1.635	0.30( 0.30)	0.99	2733.4	20300.00
10	3466.76	41.33	1.578	0.30( 0.30)	0.99	2811.4	20210.00
11	3465.93	41.42	1.576	0.30( 0.30)	0.99	2814.9	20200.00
12	3442.02	43.03	1.541	0.30( 0.30)	0.99	2870.4	20100.00
13	3352.63	47.42	1.447	0.30( 0.30)	0.98	3013.5	13600.00
14	3067.43	81.63	1.132	0.30( 0.29)	0.98	3996.5	13510.00
15	2923.76	89.97	1.075	0.30( 0.29)	0.97	4059.3	13500.00
TOTAL AREA(ACRES) = 4059.3							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 3573.11 Tc(MIN.) = 31.161  
 EFFECTIVE AREA(ACRES) = 2301.28 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 4059.3  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13684.00 = 38861.32 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13684.00 TO NODE 13685.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 200.00 DOWNSTREAM(FEET) = 194.24  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 122.69 CHANNEL SLOPE = 0.0469  
 GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.53  
 CHANNEL FLOW THRU SUBAREA(CFS) = 3573.11  
 FLOW VELOCITY(FEET/SEC.) = 18.10 FLOW DEPTH(FEET) = 4.53  
 TRAVEL TIME(MIN.) = 0.11 Tc(MIN.) = 31.27  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13685.00 = 38984.01 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3369.82	16.87	2.716	0.30( 0.30)	0.99	1274.8	21000.00
2	3447.96	19.46	2.455	0.30( 0.30)	0.99	1459.1	20810.00
3	3461.47	19.77	2.424	0.30( 0.30)	0.99	1484.1	20900.00
4	3549.79	22.25	2.258	0.30( 0.30)	0.99	1673.2	20800.00
5	3536.32	23.89	2.153	0.30( 0.30)	0.99	1787.4	20700.00
6	3573.11	31.27	1.829	0.30( 0.30)	0.99	2301.3	20600.00
7	3567.91	36.39	1.698	0.30( 0.30)	0.99	2621.4	20500.00
8	3519.35	38.58	1.642	0.30( 0.30)	0.99	2720.6	20400.00
9	3506.31	38.97	1.632	0.30( 0.30)	0.99	2733.4	20300.00
10	3466.76	41.44	1.575	0.30( 0.30)	0.99	2811.4	20210.00
11	3465.93	41.54	1.573	0.30( 0.30)	0.99	2814.9	20200.00
12	3442.02	43.14	1.539	0.30( 0.30)	0.99	2870.4	20100.00
13	3352.63	47.54	1.445	0.30( 0.30)	0.98	3013.5	13600.00
14	3067.43	81.75	1.131	0.30( 0.29)	0.98	3996.5	13510.00
15	2923.76	90.09	1.075	0.30( 0.29)	0.97	4059.3	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 3573.11 Tc(MIN.) = 31.27

AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 2301.28

\*\*\*\*\*

FLOW PROCESS FROM NODE 13685.00 TO NODE 13410.00 IS CODE = 56

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 194.24 DOWNSTREAM(FEET) = 178.72  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1843.57 CHANNEL SLOPE = 0.0084  
GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.12

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.749

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	8.39	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3578.58

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.80

AVERAGE FLOW DEPTH(FEET) = 7.12 TRAVEL TIME(MIN.) = 3.14

Tc(MIN.) = 34.41

SUBAREA AREA(ACRES) = 8.39 SUBAREA RUNOFF(CFS) = 10.94

EFFECTIVE AREA(ACRES) = 2309.67 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99

TOTAL AREA(ACRES) = 4067.7 PEAK FLOW RATE(CFS) = 3573.11

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 30.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 3.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT(FEET) = 7.11

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 7.11 FLOW VELOCITY(FEET/SEC.) = 9.79

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13410.00 = 40827.58 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3369.82	20.06	2.397	0.30( 0.30)	0.99	1283.2	21000.00
2	3447.96	22.63	2.234	0.30( 0.30)	0.99	1467.5	20810.00
3	3461.47	22.94	2.214	0.30( 0.30)	0.99	1492.5	20900.00
4	3549.79	25.39	2.066	0.30( 0.30)	0.99	1681.6	20800.00
5	3536.32	27.04	1.992	0.30( 0.30)	0.99	1795.8	20700.00
6	3573.11	34.41	1.749	0.30( 0.30)	0.99	2309.7	20600.00
7	3567.91	39.52	1.618	0.30( 0.30)	0.99	2629.8	20500.00
8	3519.35	41.73	1.569	0.30( 0.30)	0.99	2729.0	20400.00
9	3506.31	42.12	1.561	0.30( 0.30)	0.99	2741.8	20300.00
10	3466.76	44.61	1.507	0.30( 0.30)	0.99	2819.8	20210.00
11	3465.93	44.70	1.505	0.30( 0.30)	0.99	2823.3	20200.00
12	3442.02	46.31	1.471	0.30( 0.30)	0.99	2878.8	20100.00
13	3352.63	50.73	1.384	0.30( 0.30)	0.98	3021.9	13600.00
14	3067.43	85.03	1.109	0.30( 0.29)	0.98	4004.9	13510.00
15	2923.76	93.41	1.059	0.30( 0.29)	0.97	4067.7	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 3573.11 Tc(MIN.) = 34.41

AREA-AVERAGED Fm(INCH/HR) = 0.30 AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 2309.67

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 4067.7 TC(MIN.) = 34.41

EFFECTIVE AREA(ACRES) = 2309.67 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.988

PEAK FLOW RATE(CFS) = 3573.11

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3369.82	20.06	2.397	0.30( 0.30)	0.99	1283.2	21000.00
2	3447.96	22.63	2.234	0.30( 0.30)	0.99	1467.5	20810.00
3	3461.47	22.94	2.214	0.30( 0.30)	0.99	1492.5	20900.00
4	3549.79	25.39	2.066	0.30( 0.30)	0.99	1681.6	20800.00
5	3536.32	27.04	1.992	0.30( 0.30)	0.99	1795.8	20700.00
6	3573.11	34.41	1.749	0.30( 0.30)	0.99	2309.7	20600.00
7	3567.91	39.52	1.618	0.30( 0.30)	0.99	2629.8	20500.00
8	3519.35	41.73	1.569	0.30( 0.30)	0.99	2729.0	20400.00
9	3506.31	42.12	1.561	0.30( 0.30)	0.99	2741.8	20300.00
10	3466.76	44.61	1.507	0.30( 0.30)	0.99	2819.8	20210.00
11	3465.93	44.70	1.505	0.30( 0.30)	0.99	2823.3	20200.00
12	3442.02	46.31	1.471	0.30( 0.30)	0.99	2878.8	20100.00
13	3352.63	50.73	1.384	0.30( 0.30)	0.98	3021.9	13600.00
14	3067.43	85.03	1.109	0.30( 0.29)	0.98	4004.9	13510.00
15	2923.76	93.41	1.059	0.30( 0.29)	0.97	4067.7	13500.00

END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

Michael Baker International  
5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

-----  
FILE NAME: S37.DAT  
TIME/DATE OF STUDY: 11:06 07/16/2018  
=====

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-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.768
- 2) 10.00; 3.736
- 3) 15.00; 2.899
- 4) 20.00; 2.397
- 5) 25.00; 2.080
- 6) 30.00; 1.859
- 7) 40.00; 1.604
- 8) 50.00; 1.391
- 9) 60.00; 1.276
- 10) 90.00; 1.073
- 11) 120.00; 0.936
- 12) 180.00; 0.780
- 13) 360.00; 0.574
- 14) 1440.00; 0.249

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: S34.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31673.70	17.52	0.30 ( 0.29)	0.98	5058.9	21100.00
2	35586.87	27.40	0.30 ( 0.29)	0.98	8677.2	20700.00
3	38737.79	35.82	0.30 ( 0.29)	0.98	12175.2	10100.00
4	42744.09	46.65	0.30 ( 0.29)	0.97	17823.7	20100.00
5	44436.62	54.51	0.30 ( 0.29)	0.97	22152.7	31400.00
6	46235.82	64.15	0.30 ( 0.29)	0.97	27358.8	13100.00
7	47816.95	70.67	0.30 ( 0.29)	0.97	30463.5	11801.00
8	50030.41	79.97	0.30 ( 0.29)	0.97	35505.3	11530.00
9	51187.35	85.35	0.30 ( 0.29)	0.97	39153.8	13510.00
10	52239.65	90.45	0.30 ( 0.29)	0.97	42505.1	13010.00
11	53308.27	95.34	0.30 ( 0.29)	0.97	45753.6	11330.00
12	53919.91	101.63	0.30 ( 0.29)	0.97	50183.9	11130.00
13	53295.84	109.23	0.30 ( 0.29)	0.98	54174.1	12330.00
14	52611.52	115.91	0.30 ( 0.29)	0.98	57517.2	12400.00
15	51555.09	124.63	0.30 ( 0.29)	0.98	60884.6	12201.00
16	50036.79	134.05	0.30 ( 0.29)	0.98	63340.2	12101.10
17	49355.52	138.11	0.30 ( 0.29)	0.98	64190.9	10400.00
18	47520.54	146.23	0.30 ( 0.29)	0.98	65503.1	12010.00
19	45995.87	152.23	0.30 ( 0.29)	0.98	65819.6	10210.00
20	41590.08	178.60	0.30 ( 0.29)	0.98	66551.6	10100.00
TOTAL AREA (ACRES) =						66551.6

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FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 14.0  
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>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31673.70	17.52	0.30 ( 0.29)	0.98	5058.9	21100.00
2	35586.87	27.40	0.30 ( 0.29)	0.98	8677.2	20700.00
3	38737.79	35.82	0.30 ( 0.29)	0.98	12175.2	10100.00
4	42744.09	46.65	0.30 ( 0.29)	0.97	17823.7	20100.00
5	44436.62	54.51	0.30 ( 0.29)	0.97	22152.7	31400.00
6	46235.82	64.15	0.30 ( 0.29)	0.97	27358.8	13100.00
7	47816.95	70.67	0.30 ( 0.29)	0.97	30463.5	11801.00
8	50030.41	79.97	0.30 ( 0.29)	0.97	35505.3	11530.00
9	51187.35	85.35	0.30 ( 0.29)	0.97	39153.8	13510.00
10	52239.65	90.45	0.30 ( 0.29)	0.97	42505.1	13010.00
11	53308.27	95.34	0.30 ( 0.29)	0.97	45753.6	11330.00
12	53919.91	101.63	0.30 ( 0.29)	0.97	50183.9	11130.00
13	53295.84	109.23	0.30 ( 0.29)	0.98	54174.1	12330.00
14	52611.52	115.91	0.30 ( 0.29)	0.98	57517.2	12400.00
15	51555.09	124.63	0.30 ( 0.29)	0.98	60884.6	12201.00
16	50036.79	134.05	0.30 ( 0.29)	0.98	63340.2	12101.10
17	49355.52	138.11	0.30 ( 0.29)	0.98	64190.9	10400.00
18	47520.54	146.23	0.30 ( 0.29)	0.98	65503.1	12010.00

19 45995.87 152.23 0.30( 0.29) 0.98 65819.6 10210.00  
20 41590.08 178.60 0.30( 0.29) 0.98 66551.6 10100.00  
TOTAL AREA(ACRES) = 66551.6

\*\*\*\*\*

FLOW PROCESS FROM NODE 13700.00 TO NODE 13701.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 170.00 DOWNSTREAM(FEET) = 167.50  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1699.11 CHANNEL SLOPE = 0.0015  
GIVEN CHANNEL BASE(FEET) = 200.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 17.54  
CHANNEL FLOW THRU SUBAREA(CFS) = 53919.91  
FLOW VELOCITY(FEET/SEC.) = 10.68 FLOW DEPTH(FEET) = 17.54  
TRAVEL TIME(MIN.) = 2.65 Tc(MIN.) = 104.28  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13701.00 = 126251.08 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13701.00 TO NODE 13701.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*

FLOW PROCESS FROM NODE 13701.00 TO NODE 13701.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0509102Y.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	294.69	22.88	0.30( 0.26)	0.87	167.7	10200.00

TOTAL AREA(ACRES) = 167.7

\*\*\*\*\*

FLOW PROCESS FROM NODE 13701.00 TO NODE 13701.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31673.70	20.64	2.356	0.30( 0.29)	0.98	5058.9	21100.00
2	35586.87	30.41	1.848	0.30( 0.29)	0.98	8677.2	20700.00
3	38737.79	38.75	1.636	0.30( 0.29)	0.98	12175.2	10100.00
4	42744.09	49.50	1.402	0.30( 0.29)	0.97	17823.7	20100.00
5	44436.62	57.32	1.307	0.30( 0.29)	0.97	22152.7	31400.00
6	46235.82	66.93	1.229	0.30( 0.29)	0.97	27358.8	13100.00
7	47816.95	73.42	1.185	0.30( 0.29)	0.97	30463.5	11801.00
8	50030.41	82.68	1.123	0.30( 0.29)	0.97	35505.3	11530.00
9	51187.35	88.04	1.086	0.30( 0.29)	0.97	39153.8	13510.00
10	52239.65	93.13	1.059	0.30( 0.29)	0.97	42505.1	13010.00
11	53308.27	98.00	1.036	0.30( 0.29)	0.97	45753.6	11330.00

12	53919.91	104.28	1.008	0.30( 0.29)	0.97	50183.9	11130.00
13	53295.84	111.90	0.973	0.30( 0.29)	0.98	54174.1	12330.00
14	52611.52	118.58	0.942	0.30( 0.29)	0.98	57517.2	12400.00
15	51555.09	127.32	0.917	0.30( 0.29)	0.98	60884.6	12201.00
16	50036.79	136.76	0.892	0.30( 0.29)	0.98	63340.2	12101.10
17	49355.52	140.84	0.882	0.30( 0.29)	0.98	64190.9	10400.00
18	47520.54	148.98	0.861	0.30( 0.29)	0.98	65503.1	12010.00
19	45995.87	155.01	0.845	0.30( 0.29)	0.98	65819.6	10210.00
20	41590.08	181.47	0.778	0.30( 0.29)	0.98	66551.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13701.00 = 126251.08 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	294.69	22.88	2.214	0.30( 0.26)	0.87	167.7	10200.00

LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 13701.00 = 9099.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31958.86	20.64	2.356	0.30( 0.29)	0.98	5210.1	21100.00
2	32866.35	22.88	2.214	0.30( 0.29)	0.98	6056.9	10200.00
3	35826.36	30.41	1.848	0.30( 0.29)	0.98	8844.9	20700.00
4	38945.21	38.75	1.636	0.30( 0.29)	0.98	12342.9	10100.00
5	42916.16	49.50	1.402	0.30( 0.29)	0.97	17991.4	20100.00
6	44594.36	57.32	1.307	0.30( 0.29)	0.97	22320.4	31400.00
7	46381.84	66.93	1.229	0.30( 0.29)	0.97	27526.4	13100.00
8	47956.34	73.42	1.185	0.30( 0.29)	0.97	30631.1	11801.00
9	50160.34	82.68	1.123	0.30( 0.29)	0.97	35672.9	11530.00
10	51311.81	88.04	1.086	0.30( 0.29)	0.97	39321.5	13510.00
11	52359.96	93.13	1.059	0.30( 0.29)	0.97	42672.7	13010.00
12	53425.22	98.00	1.036	0.30( 0.29)	0.97	45921.2	11330.00
13	54032.53	104.28	1.008	0.30( 0.29)	0.97	50351.6	11130.00
14	53403.21	111.90	0.973	0.30( 0.29)	0.98	54341.8	12330.00
15	52714.29	118.58	0.942	0.30( 0.29)	0.98	57684.9	12400.00
16	51654.00	127.32	0.917	0.30( 0.29)	0.98	61052.2	12201.00
17	50132.00	136.76	0.892	0.30( 0.29)	0.98	63507.9	12101.10
18	49449.12	140.84	0.882	0.30( 0.29)	0.98	64358.6	10400.00
19	47610.95	148.98	0.861	0.30( 0.29)	0.98	65670.7	12010.00
20	46083.92	155.01	0.845	0.30( 0.29)	0.98	65987.3	10210.00
21	41668.07	181.47	0.778	0.30( 0.29)	0.98	66719.3	10100.00

TOTAL AREA(ACRES) = 66719.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 54032.53 Tc(MIN.) = 104.277  
EFFECTIVE AREA(ACRES) = 50351.59 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA(ACRES) = 66719.3  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13701.00 = 126251.08 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13701.00 TO NODE 13720.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 167.50 DOWNSTREAM(FEET) = 165.51  
CHANNEL LENGTH THRU SUBAREA(FEET) = 192.72 CHANNEL SLOPE = 0.0103



GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 10.27  
 CHANNEL FLOW THRU SUBAREA (CFS) = 54032.53  
 FLOW VELOCITY (FEET/SEC.) = 20.92 FLOW DEPTH (FEET) = 10.27  
 TRAVEL TIME (MIN.) = 0.15 Tc (MIN.) = 104.43  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13720.00 = 126443.80 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13720.00 TO NODE 13740.00 IS CODE = 56  
 -----

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<  
 >>>> TRAVELTIME THRU SUBAREA <<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 165.51 DOWNSTREAM (FEET) = 161.63  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2042.40 CHANNEL SLOPE = 0.0019  
 GIVEN CHANNEL BASE (FEET) = 200.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 16.40  
 CHANNEL FLOW THRU SUBAREA (CFS) = 54032.53  
 FLOW VELOCITY (FEET/SEC.) = 11.68 FLOW DEPTH (FEET) = 16.40  
 TRAVEL TIME (MIN.) = 2.91 Tc (MIN.) = 107.34  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13740.00 = 128486.20 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13720.00 TO NODE 13740.00 IS CODE = 12  
 -----

>>>> CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13740.00 TO NODE 13740.00 IS CODE = 15.1  
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>>>> DEFINE MEMORY BANK # 3 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: 0509103Y.DNA  
 MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	861.38	21.52	0.30 ( 0.28)	0.95	474.8	10300.00
TOTAL AREA (ACRES) =						474.8

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13740.00 TO NODE 13740.00 IS CODE = 11  
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>>>> CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY <<<<<

\*\*\*\*\*

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31958.86	24.25	2.128	0.30 ( 0.29)	0.98	5210.1	21100.00
2	32866.35	26.46	2.016	0.30 ( 0.29)	0.98	6056.9	10200.00
3	35826.36	33.89	1.760	0.30 ( 0.29)	0.98	8844.9	20700.00
4	38945.21	42.14	1.558	0.30 ( 0.29)	0.98	12342.9	10100.00
5	42916.16	52.79	1.359	0.30 ( 0.29)	0.97	17991.4	20100.00
6	44594.36	60.57	1.272	0.30 ( 0.29)	0.97	22320.4	31400.00
7	46381.84	70.14	1.207	0.30 ( 0.29)	0.97	27526.4	13100.00

8	47956.34	76.60	1.164	0.30 ( 0.29)	0.97	30631.1	11801.00
9	50160.34	85.82	1.101	0.30 ( 0.29)	0.97	35672.9	11530.00
10	51311.81	91.16	1.068	0.30 ( 0.29)	0.97	39321.5	13510.00
11	52359.96	96.22	1.045	0.30 ( 0.29)	0.97	42672.7	13010.00
12	53425.22	101.08	1.022	0.30 ( 0.29)	0.97	45921.2	11330.00
13	54032.53	107.34	0.994	0.30 ( 0.29)	0.97	50351.6	11130.00
14	53403.21	114.97	0.959	0.30 ( 0.29)	0.98	54341.8	12330.00
15	52714.29	121.67	0.932	0.30 ( 0.29)	0.98	57684.9	12400.00
16	51654.00	130.43	0.909	0.30 ( 0.29)	0.98	61052.2	12201.00
17	50132.00	139.90	0.884	0.30 ( 0.29)	0.98	63507.9	12101.10
18	49449.12	143.99	0.874	0.30 ( 0.29)	0.98	64358.6	10400.00
19	47610.95	152.17	0.852	0.30 ( 0.29)	0.98	65670.7	12010.00
20	46083.92	158.23	0.837	0.30 ( 0.29)	0.98	65987.3	10210.00
21	41668.07	184.79	0.775	0.30 ( 0.29)	0.98	66719.3	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13740.00 = 128486.20 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	861.38	21.52	2.301	0.30 ( 0.28)	0.95	474.8	10300.00
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 13740.00 =							8072.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31899.56	21.52	2.301	0.30 ( 0.29)	0.97	5099.3	10300.00
2	32746.42	24.25	2.128	0.30 ( 0.29)	0.97	5684.9	21100.00
3	33605.96	26.46	2.016	0.30 ( 0.29)	0.97	6531.6	10200.00
4	36456.66	33.89	1.760	0.30 ( 0.29)	0.98	9319.7	20700.00
5	39489.51	42.14	1.558	0.30 ( 0.29)	0.98	12817.7	10100.00
6	43375.20	52.79	1.359	0.30 ( 0.29)	0.97	18466.1	20100.00
7	45016.29	60.57	1.272	0.30 ( 0.29)	0.97	22795.2	31400.00
8	46776.11	70.14	1.207	0.30 ( 0.29)	0.97	28001.2	13100.00
9	48331.92	76.60	1.164	0.30 ( 0.29)	0.97	31105.9	11801.00
10	50509.27	85.82	1.101	0.30 ( 0.29)	0.97	36147.7	11530.00
11	51646.39	91.16	1.068	0.30 ( 0.29)	0.97	39796.3	13510.00
12	52684.66	96.22	1.045	0.30 ( 0.29)	0.97	43147.5	13010.00
13	53740.43	101.08	1.022	0.30 ( 0.29)	0.97	46396.0	11330.00
14	54335.53	107.34	0.994	0.30 ( 0.29)	0.97	50826.3	11130.00
15	53691.32	114.97	0.959	0.30 ( 0.29)	0.97	54816.6	12330.00
16	52990.73	121.67	0.932	0.30 ( 0.29)	0.98	58159.6	12400.00
17	51920.71	130.43	0.909	0.30 ( 0.29)	0.98	61527.0	12201.00
18	50388.20	139.90	0.884	0.30 ( 0.29)	0.98	63982.6	12101.10
19	49700.78	143.99	0.874	0.30 ( 0.29)	0.98	64833.4	10400.00
20	47853.51	152.17	0.852	0.30 ( 0.29)	0.98	66145.5	12010.00
21	46319.75	158.23	0.837	0.30 ( 0.29)	0.98	66462.0	10210.00
22	41877.37	184.79	0.775	0.30 ( 0.29)	0.98	67194.1	10100.00
TOTAL AREA (ACRES) =						67194.1	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 54335.53 Tc (MIN.) = 107.343  
 EFFECTIVE AREA (ACRES) = 50826.34 AREA-AVERAGED Fm (INCH/HR) = 0.29  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA (ACRES) = 67194.1  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13740.00 = 128486.20 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13740.00 TO NODE 13741.00 IS CODE = 56  
 -----

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-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 161.63 DOWNSTREAM(FEET) = 141.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 389.20 CHANNEL SLOPE = 0.0530
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 9.30
CHANNEL FLOW THRU SUBAREA(CFS) = 54335.53
FLOW VELOCITY(FEET/SEC.) = 42.60 FLOW DEPTH(FEET) = 9.30
TRAVEL TIME(MIN.) = 0.15 Tc(MIN.) = 107.50
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13741.00 = 128875.40 FEET.

*****
FLOW PROCESS FROM NODE 13741.00 TO NODE 13802.00 IS CODE = 56
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 141.00 DOWNSTREAM(FEET) = 135.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1533.41 CHANNEL SLOPE = 0.0039
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030
*ESTIMATED CHANNEL HEIGHT(FEET) = 18.48
CHANNEL FLOW THRU SUBAREA(CFS) = 54335.53
FLOW VELOCITY(FEET/SEC.) = 16.90 FLOW DEPTH(FEET) = 18.48
TRAVEL TIME(MIN.) = 1.51 Tc(MIN.) = 109.01
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13802.00 = 130408.80 FEET.

*****
FLOW PROCESS FROM NODE 13802.00 TO NODE 13802.00 IS CODE = 12
-----
>>>>CLEAR MEMORY BANK # 3 <<<<
=====
FLOW PROCESS FROM NODE 13802.00 TO NODE 13802.00 IS CODE = 15.1
-----
>>>>DEFINE MEMORY BANK # 3 <<<<
=====
PEAK FLOWRATE TABLE FILE NAME: 0509104Y.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 854.15 29.90 0.30( 0.28) 0.94 599.8 10400.00
TOTAL AREA(ACRES) = 599.8

*****
FLOW PROCESS FROM NODE 13802.00 TO NODE 13802.00 IS CODE = 11
-----
>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<
=====
** MAIN STREAM CONFLUENCE DATA **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 31899.56 23.46 2.178 0.30( 0.29) 0.97 5099.3 10300.00

```

```

2 32746.42 26.17 2.028 0.30( 0.29) 0.97 5684.9 21100.00
3 33605.96 28.37 1.931 0.30( 0.29) 0.97 6531.6 10200.00
4 36456.66 35.76 1.712 0.30( 0.29) 0.98 9319.7 20700.00
5 39489.51 43.96 1.520 0.30( 0.29) 0.98 12817.7 10100.00
6 43375.20 54.56 1.339 0.30( 0.29) 0.97 18466.1 20100.00
7 45016.29 62.33 1.260 0.30( 0.29) 0.97 22795.2 31400.00
8 46776.11 71.87 1.196 0.30( 0.29) 0.97 28001.2 13100.00
9 48331.92 78.32 1.152 0.30( 0.29) 0.97 31105.9 11801.00
10 50509.27 87.52 1.090 0.30( 0.29) 0.97 36147.7 11530.00
11 51646.39 92.85 1.060 0.30( 0.29) 0.97 39796.3 13510.00
12 52684.66 97.90 1.037 0.30( 0.29) 0.97 43147.5 13010.00
13 53740.43 102.75 1.015 0.30( 0.29) 0.97 46396.0 11330.00
14 54335.53 109.01 0.986 0.30( 0.29) 0.97 50826.3 11130.00
15 53691.32 116.64 0.951 0.30( 0.29) 0.97 54816.6 12330.00
16 52990.73 123.35 0.927 0.30( 0.29) 0.98 58159.6 12400.00
17 51920.71 132.11 0.905 0.30( 0.29) 0.98 61527.0 12201.00
18 50388.20 141.60 0.880 0.30( 0.29) 0.98 63982.6 12101.10
19 49700.78 145.69 0.869 0.30( 0.29) 0.98 64833.4 10400.00
20 47853.51 153.90 0.848 0.30( 0.29) 0.98 66145.5 12010.00
21 46319.75 159.97 0.832 0.30( 0.29) 0.98 66462.0 10210.00
22 41877.37 186.58 0.772 0.30( 0.29) 0.98 67194.1 10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13802.00 = 130408.80 FEET.

```

```

** MEMORY BANK # 3 CONFLUENCE DATA **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 854.15 29.90 1.864 0.30( 0.28) 0.94 599.8 10400.00
LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 13802.00 = 12273.00 FEET.

```

```

** PEAK FLOW RATE TABLE **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 32702.86 23.46 2.178 0.30( 0.29) 0.97 5569.9 10300.00
2 33571.93 26.17 2.028 0.30( 0.29) 0.97 6209.9 21100.00
3 34451.04 28.37 1.931 0.30( 0.29) 0.97 7100.7 10200.00
4 35050.78 29.90 1.864 0.30( 0.29) 0.97 7709.1 10400.00
5 37229.10 35.76 1.712 0.30( 0.29) 0.97 9919.5 20700.00
6 40158.00 43.96 1.520 0.30( 0.29) 0.97 13417.4 10100.00
7 43945.89 54.56 1.339 0.30( 0.29) 0.97 19065.9 20100.00
8 45544.71 62.33 1.260 0.30( 0.29) 0.97 23394.9 31400.00
9 47269.65 71.87 1.196 0.30( 0.29) 0.97 28601.0 13100.00
10 48801.91 78.32 1.152 0.30( 0.29) 0.97 31705.7 11801.00
11 50945.66 87.52 1.090 0.30( 0.29) 0.97 36747.5 11530.00
12 52066.70 92.85 1.060 0.30( 0.29) 0.97 40396.1 13510.00
13 53092.50 97.90 1.037 0.30( 0.29) 0.97 43747.3 13010.00
14 54136.32 102.75 1.015 0.30( 0.29) 0.97 46995.8 11330.00
15 54715.98 109.01 0.986 0.30( 0.29) 0.97 51426.1 11130.00
16 54052.95 116.64 0.951 0.30( 0.29) 0.97 55416.3 12330.00
17 53339.39 123.35 0.927 0.30( 0.29) 0.98 58759.4 12400.00
18 52257.07 132.11 0.905 0.30( 0.29) 0.98 62126.8 12201.00
19 50711.23 141.60 0.880 0.30( 0.29) 0.98 64582.4 12101.10
20 50018.07 145.69 0.869 0.30( 0.29) 0.98 65433.1 10400.00
21 48159.29 153.90 0.848 0.30( 0.29) 0.98 66745.3 12010.00
22 46617.00 159.97 0.832 0.30( 0.29) 0.98 67061.8 10210.00
23 42142.44 186.58 0.772 0.30( 0.29) 0.98 67793.9 10100.00
TOTAL AREA(ACRES) = 67793.9

```

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 54715.98 Tc(MIN.) = 109.008  
 EFFECTIVE AREA(ACRES) = 51426.12 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 67793.9  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13802.00 = 130408.80 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13802.00 TO NODE 13803.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 135.00 DOWNSTREAM(FEET) = 133.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 207.23 CHANNEL SLOPE = 0.0097  
 GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 14.71  
 CHANNEL FLOW THRU SUBAREA(CFS) = 54715.98  
 FLOW VELOCITY(FEET/SEC.) = 23.42 FLOW DEPTH(FEET) = 14.71  
 TRAVEL TIME(MIN.) = 0.15 Tc(MIN.) = 109.16  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13803.00 = 130616.03 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13802.00 TO NODE 13803.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 3 <<<<<

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 67793.9 TC(MIN.) = 109.16  
 EFFECTIVE AREA(ACRES) = 51426.12 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.973  
 PEAK FLOW RATE(CFS) = 54715.98

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	32702.86	23.63	2.167	0.30( 0.29)	0.97	5569.9	10300.00
2	33571.93	26.34	2.021	0.30( 0.29)	0.97	6209.9	21100.00
3	34451.04	28.53	1.924	0.30( 0.29)	0.97	7100.7	10200.00
4	35050.78	30.06	1.857	0.30( 0.29)	0.97	7709.1	10400.00
5	37229.10	35.92	1.708	0.30( 0.29)	0.97	9919.5	20700.00
6	40158.00	44.12	1.516	0.30( 0.29)	0.97	13417.4	10100.00
7	43945.89	54.72	1.337	0.30( 0.29)	0.97	19065.9	20100.00
8	45544.71	62.48	1.259	0.30( 0.29)	0.97	23394.9	31400.00
9	47269.65	72.03	1.195	0.30( 0.29)	0.97	28601.0	13100.00
10	48801.91	78.47	1.151	0.30( 0.29)	0.97	31705.7	11801.00
11	50945.66	87.67	1.089	0.30( 0.29)	0.97	36747.5	11530.00
12	52066.70	93.00	1.059	0.30( 0.29)	0.97	40396.1	13510.00
13	53092.50	98.05	1.036	0.30( 0.29)	0.97	43747.3	13010.00
14	54136.32	102.90	1.014	0.30( 0.29)	0.97	46995.8	11330.00
15	54715.98	109.16	0.986	0.30( 0.29)	0.97	51426.1	11130.00
16	54052.95	116.79	0.951	0.30( 0.29)	0.97	55416.3	12330.00
17	53339.39	123.50	0.927	0.30( 0.29)	0.98	58759.4	12400.00
18	52257.07	132.26	0.904	0.30( 0.29)	0.98	62126.8	12201.00
19	50711.23	141.75	0.879	0.30( 0.29)	0.98	64582.4	12101.10
20	50018.07	145.84	0.869	0.30( 0.29)	0.98	65433.1	10400.00
21	48159.29	154.05	0.847	0.30( 0.29)	0.98	66745.3	12010.00

22 46617.00 160.12 0.832 0.30( 0.29) 0.98 67061.8 10210.00  
 23 42142.44 186.74 0.772 0.30( 0.29) 0.98 67793.9 10100.00

=====  
 END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

Michael Baker International  
5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

-----  
FILE NAME: S38.DAT  
TIME/DATE OF STUDY: 11:06 07/16/2018  
=====

=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*

NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.749
- 2) 10.00; 3.727
- 3) 15.00; 2.893
- 4) 20.00; 2.393
- 5) 25.00; 2.078
- 6) 30.00; 1.857
- 7) 40.00; 1.601
- 8) 50.00; 1.389
- 9) 60.00; 1.274
- 10) 90.00; 1.070
- 11) 120.00; 0.933
- 12) 180.00; 0.777
- 13) 360.00; 0.572
- 14) 1200.00; 0.248

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO STREET-CROSSFALL (FT)	IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13803.00 TO NODE 13803.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<

-----  
PEAK FLOWRATE TABLE FILE NAME: S37.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	35050.78	30.06	0.30 ( 0.29)	0.97	7709.1	10400.00
2	37229.10	35.92	0.30 ( 0.29)	0.97	9919.5	20700.00
3	40158.00	44.12	0.30 ( 0.29)	0.97	13417.4	10100.00
4	43945.89	54.72	0.30 ( 0.29)	0.97	19065.9	20100.00
5	45544.71	62.48	0.30 ( 0.29)	0.97	23394.9	31400.00
6	47269.65	72.03	0.30 ( 0.29)	0.97	28601.0	13100.00
7	48801.91	78.47	0.30 ( 0.29)	0.97	31705.7	11801.00
8	50945.66	87.67	0.30 ( 0.29)	0.97	36747.5	11530.00
9	52066.70	93.00	0.30 ( 0.29)	0.97	40396.1	13510.00
10	53092.50	98.05	0.30 ( 0.29)	0.97	43747.3	13010.00
11	54136.32	102.90	0.30 ( 0.29)	0.97	46995.8	11330.00
12	54715.98	109.16	0.30 ( 0.29)	0.97	51426.1	11130.00
13	54052.95	116.79	0.30 ( 0.29)	0.97	55416.3	12330.00
14	53339.39	123.50	0.30 ( 0.29)	0.98	58759.4	12400.00
15	52257.07	132.26	0.30 ( 0.29)	0.98	62126.8	12201.00
16	50711.23	141.75	0.30 ( 0.29)	0.98	64582.4	12101.10
17	50018.07	145.84	0.30 ( 0.29)	0.98	65433.1	10400.00
18	48159.29	154.05	0.30 ( 0.29)	0.98	66745.3	12010.00
19	46617.00	160.12	0.30 ( 0.29)	0.98	67061.8	10210.00
20	42142.44	186.74	0.30 ( 0.29)	0.98	67793.9	10100.00
TOTAL AREA (ACRES) =						67793.9

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13803.00 TO NODE 13803.00 IS CODE = 14.0  
-----

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

-----  
MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	35050.78	30.06	0.30 ( 0.29)	0.97	7709.1	10400.00
2	37229.10	35.92	0.30 ( 0.29)	0.97	9919.5	20700.00
3	40158.00	44.12	0.30 ( 0.29)	0.97	13417.4	10100.00
4	43945.89	54.72	0.30 ( 0.29)	0.97	19065.9	20100.00
5	45544.71	62.48	0.30 ( 0.29)	0.97	23394.9	31400.00
6	47269.65	72.03	0.30 ( 0.29)	0.97	28601.0	13100.00
7	48801.91	78.47	0.30 ( 0.29)	0.97	31705.7	11801.00
8	50945.66	87.67	0.30 ( 0.29)	0.97	36747.5	11530.00
9	52066.70	93.00	0.30 ( 0.29)	0.97	40396.1	13510.00
10	53092.50	98.05	0.30 ( 0.29)	0.97	43747.3	13010.00
11	54136.32	102.90	0.30 ( 0.29)	0.97	46995.8	11330.00
12	54715.98	109.16	0.30 ( 0.29)	0.97	51426.1	11130.00
13	54052.95	116.79	0.30 ( 0.29)	0.97	55416.3	12330.00
14	53339.39	123.50	0.30 ( 0.29)	0.98	58759.4	12400.00
15	52257.07	132.26	0.30 ( 0.29)	0.98	62126.8	12201.00
16	50711.23	141.75	0.30 ( 0.29)	0.98	64582.4	12101.10
17	50018.07	145.84	0.30 ( 0.29)	0.98	65433.1	10400.00
18	48159.29	154.05	0.30 ( 0.29)	0.98	66745.3	12010.00

19 46617.00 160.12 0.30( 0.29) 0.98 67061.8 10210.00  
20 42142.44 186.74 0.30( 0.29) 0.98 67793.9 10100.00  
TOTAL AREA (ACRES) = 67793.9

\*\*\*\*\*

FLOW PROCESS FROM NODE 13803.00 TO NODE 13820.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 140.00 DOWNSTREAM(FEET) = 137.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 926.91 CHANNEL SLOPE = 0.0032  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 19.47

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 0.978

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	53.70	0.30	0.983	-

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.983

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 54732.50

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.81

AVERAGE FLOW DEPTH(FEET) = 19.47 TRAVEL TIME(MIN.) = 0.98

Tc(MIN.) = 110.13

SUBAREA AREA(ACRES) = 53.70 SUBAREA RUNOFF(CFS) = 33.02

EFFECTIVE AREA(ACRES) = 51479.82 AREA-AVERAGED Fm(INCH/HR) = 0.29

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97

TOTAL AREA(ACRES) = 67847.6 PEAK FLOW RATE(CFS) = 54715.98

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 19.46

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 19.46 FLOW VELOCITY(FEET/SEC.) = 15.81

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13820.00 = 131542.94 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13803.00 TO NODE 13820.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 110.13

RAINFALL INTENSITY(INCH/HR) = 0.98

AREA-AVERAGED Fm(INCH/HR) = 0.29

AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.97

EFFECTIVE STREAM AREA(ACRES) = 51479.82

TOTAL STREAM AREA(ACRES) = 67847.55

PEAK FLOW RATE(CFS) AT CONFLUENCE = 54715.98

\*\*\*\*\*

FLOW PROCESS FROM NODE 13810.00 TO NODE 13811.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 648.54  
ELEVATION DATA: UPSTREAM(FEET) = 756.46 DOWNSTREAM(FEET) = 586.02

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

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.293

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.345

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER						
"CHAPARRAL,BROADLEAF"	-	5.58	0.30	1.000	0	12.29

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

SUBAREA RUNOFF(CFS) = 15.29

TOTAL AREA(ACRES) = 5.58 PEAK FLOW RATE(CFS) = 15.29

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FLOW PROCESS FROM NODE 13811.00 TO NODE 13811.50 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 586.02 DOWNSTREAM(FEET) = 437.69  
CHANNEL LENGTH THRU SUBAREA(FEET) = 696.28 CHANNEL SLOPE = 0.2130  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.49

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.044

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	14.79	0.30	1.000	-

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 33.60

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.45

AVERAGE FLOW DEPTH(FEET) = 0.48 TRAVEL TIME(MIN.) = 1.80

Tc(MIN.) = 14.09

SUBAREA AREA(ACRES) = 14.79 SUBAREA RUNOFF(CFS) = 36.53

EFFECTIVE AREA(ACRES) = 20.37 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 20.4 PEAK FLOW RATE(CFS) = 50.31

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.60

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.60 FLOW VELOCITY(FEET/SEC.) = 7.49

LONGEST FLOWPATH FROM NODE 13810.00 TO NODE 13811.50 = 1344.82 FEET.

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FLOW PROCESS FROM NODE 13811.50 TO NODE 13812.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 437.69 DOWNSTREAM(FEET) = 402.36
CHANNEL LENGTH THRU SUBAREA(FEET) = 681.04 CHANNEL SLOPE = 0.0519
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.12
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.768
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap   SCS
    LAND USE         GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED         -      18.41    0.30    1.000  -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 70.77
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.27
AVERAGE FLOW DEPTH(FEET) = 1.10 TRAVEL TIME(MIN.) = 2.16
Tc(MIN.) = 16.25
SUBAREA AREA(ACRES) = 18.41 SUBAREA RUNOFF(CFS) = 40.90
EFFECTIVE AREA(ACRES) = 38.78 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 38.8 PEAK FLOW RATE(CFS) = 86.15
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.23

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.23 FLOW VELOCITY(FEET/SEC.) = 5.60
LONGEST FLOWPATH FROM NODE 13810.00 TO NODE 13812.00 = 2025.86 FEET.

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FLOW PROCESS FROM NODE 13812.00 TO NODE 13813.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 402.36 DOWNSTREAM(FEET) = 259.72
CHANNEL LENGTH THRU SUBAREA(FEET) = 1282.56 CHANNEL SLOPE = 0.1112
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.18
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.500
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap   SCS
    LAND USE         GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED         -      27.87    0.30    0.858  -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.858
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 114.30
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.96
AVERAGE FLOW DEPTH(FEET) = 1.16 TRAVEL TIME(MIN.) = 2.68
Tc(MIN.) = 18.93
SUBAREA AREA(ACRES) = 27.87 SUBAREA RUNOFF(CFS) = 56.24
EFFECTIVE AREA(ACRES) = 66.65 AREA-AVERAGED Fm(INCH/HR) = 0.28
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.94
TOTAL AREA(ACRES) = 66.7 PEAK FLOW RATE(CFS) = 133.02
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 1.27

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.27 FLOW VELOCITY(FEET/SEC.) = 8.34
LONGEST FLOWPATH FROM NODE 13810.00 TO NODE 13813.00 = 3308.42 FEET.

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FLOW PROCESS FROM NODE 13813.00 TO NODE 13820.00 IS CODE = 31
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>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 259.72 DOWNSTREAM(FEET) = 137.00
FLOW LENGTH(FEET) = 2412.88 MANNING'S N = 0.013
DEPTH OF FLOW IN 36.0 INCH PIPE IS 27.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 22.94
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 133.02
PIPE TRAVEL TIME(MIN.) = 1.75 Tc(MIN.) = 20.69
LONGEST FLOWPATH FROM NODE 13810.00 TO NODE 13820.00 = 5721.30 FEET.

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FLOW PROCESS FROM NODE 13813.00 TO NODE 13820.00 IS CODE = 81
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>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<

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MAINLINE Tc(MIN.) = 20.69
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.350
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap   SCS
    LAND USE         GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED         -      82.54    0.30    0.570  -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.570
SUBAREA AREA(ACRES) = 82.54 SUBAREA RUNOFF(CFS) = 161.85
EFFECTIVE AREA(ACRES) = 149.19 AREA-AVERAGED Fm(INCH/HR) = 0.22
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.74
TOTAL AREA(ACRES) = 149.2 PEAK FLOW RATE(CFS) = 285.88

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*****
FLOW PROCESS FROM NODE 13813.00 TO NODE 13820.00 IS CODE = 1
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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

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TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 20.69
RAINFALL INTENSITY(INCH/HR) = 2.35
AREA-AVERAGED Fm(INCH/HR) = 0.22
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.74
EFFECTIVE STREAM AREA(ACRES) = 149.19
TOTAL STREAM AREA(ACRES) = 149.19
PEAK FLOW RATE(CFS) AT CONFLUENCE = 285.88

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** CONFLUENCE DATA **

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STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
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1	35050.78	31.17	1.827	0.30 ( 0.29)	0.97	7762.8	10400.00
1	37229.10	37.01	1.678	0.30 ( 0.29)	0.97	9973.2	20700.00
1	40158.00	45.18	1.491	0.30 ( 0.29)	0.97	13471.1	10100.00
1	43945.89	55.75	1.323	0.30 ( 0.29)	0.97	19119.6	20100.00
1	45544.71	63.51	1.250	0.30 ( 0.29)	0.97	23448.6	31400.00
1	47269.65	73.05	1.185	0.30 ( 0.29)	0.97	28654.7	13100.00
1	48801.91	79.48	1.142	0.30 ( 0.29)	0.97	31759.4	11801.00
1	50945.66	88.67	1.079	0.30 ( 0.29)	0.97	36801.2	11530.00
1	52066.70	93.99	1.052	0.30 ( 0.29)	0.97	40449.8	13510.00
1	53092.50	99.04	1.029	0.30 ( 0.29)	0.97	43801.0	13010.00
1	54136.32	103.88	1.007	0.30 ( 0.29)	0.97	47049.5	11330.00
1	54715.98	110.13	0.978	0.30 ( 0.29)	0.97	51479.8	11130.00
1	54052.95	117.77	0.943	0.30 ( 0.29)	0.97	55470.0	12330.00
1	53339.39	124.48	0.921	0.30 ( 0.29)	0.98	58813.1	12400.00
1	52257.07	133.25	0.899	0.30 ( 0.29)	0.98	62180.5	12201.00
1	50711.23	142.75	0.874	0.30 ( 0.29)	0.98	64636.1	12101.10
1	50018.07	146.85	0.863	0.30 ( 0.29)	0.98	65486.8	10400.00
1	48159.29	155.06	0.842	0.30 ( 0.29)	0.98	66799.0	12010.00
1	46617.00	161.14	0.826	0.30 ( 0.29)	0.98	67115.5	10210.00
1	42142.44	187.79	0.768	0.30 ( 0.29)	0.98	67847.6	10100.00
2	285.88	20.69	2.350	0.30 ( 0.22)	0.74	149.2	13810.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31467.17	20.69	2.350	0.30 ( 0.29)	0.97	5301.1	13810.00
2	35266.48	31.17	1.827	0.30 ( 0.29)	0.97	7912.0	10400.00
3	37424.73	37.01	1.678	0.30 ( 0.29)	0.97	10122.3	20700.00
4	40328.59	45.18	1.491	0.30 ( 0.29)	0.97	13620.3	10100.00
5	44093.89	55.75	1.323	0.30 ( 0.29)	0.97	19268.8	20100.00
6	45682.95	63.51	1.250	0.30 ( 0.29)	0.97	23597.8	31400.00
7	47399.18	73.05	1.185	0.30 ( 0.29)	0.96	28803.9	13100.00
8	48925.55	79.48	1.142	0.30 ( 0.29)	0.96	31908.6	11801.00
9	51060.93	88.67	1.079	0.30 ( 0.29)	0.97	36950.4	11530.00
10	52178.30	93.99	1.052	0.30 ( 0.29)	0.97	40598.9	13510.00
11	53201.00	99.04	1.029	0.30 ( 0.29)	0.97	43950.2	13010.00
12	54241.85	103.88	1.007	0.30 ( 0.29)	0.97	47198.6	11330.00
13	54817.69	110.13	0.978	0.30 ( 0.29)	0.97	51629.0	11130.00
14	54149.97	117.77	0.943	0.30 ( 0.29)	0.97	55619.2	12330.00
15	53433.48	124.48	0.921	0.30 ( 0.29)	0.97	58962.3	12400.00
16	52348.10	133.25	0.899	0.30 ( 0.29)	0.98	62329.7	12201.00
17	50798.95	142.75	0.874	0.30 ( 0.29)	0.98	64785.3	12101.10
18	50104.35	146.85	0.863	0.30 ( 0.29)	0.98	65636.0	10400.00
19	48242.70	155.06	0.842	0.30 ( 0.29)	0.98	66948.1	12010.00
20	46698.29	161.14	0.826	0.30 ( 0.29)	0.98	67264.7	10210.00
21	42215.96	187.79	0.768	0.30 ( 0.29)	0.98	67996.7	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 54817.69 Tc(MIN.) = 110.13  
EFFECTIVE AREA(ACRES) = 51629.01 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA(ACRES) = 67996.7  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13820.00 = 131542.94 FEET.

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FLOW PROCESS FROM NODE 13820.00 TO NODE 13840.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 137.00 DOWNSTREAM(FEET) = 133.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1261.34 CHANNEL SLOPE = 0.0032  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 19.58

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 0.972

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	31.60	0.30	0.683	-

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 54828.59

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 15.70

AVERAGE FLOW DEPTH(FEET) = 19.58 TRAVEL TIME(MIN.) = 1.34

Tc(MIN.) = 111.47

SUBAREA AREA(ACRES) = 31.60 SUBAREA RUNOFF(CFS) = 21.82

EFFECTIVE AREA(ACRES) = 51660.61 AREA-AVERAGED Fm(INCH/HR) = 0.29

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97

TOTAL AREA(ACRES) = 68028.3 PEAK FLOW RATE(CFS) = 54817.69

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030

\*ESTIMATED CHANNEL HEIGHT(FEET) = 19.58

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 19.58 FLOW VELOCITY(FEET/SEC.) = 15.70

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13840.00 = 132804.28 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13820.00 TO NODE 13840.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 111.47

RAINFALL INTENSITY(INCH/HR) = 0.97

AREA-AVERAGED Fm(INCH/HR) = 0.29

AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.97

EFFECTIVE STREAM AREA(ACRES) = 51660.61

TOTAL STREAM AREA(ACRES) = 68028.34

PEAK FLOW RATE(CFS) AT CONFLUENCE = 54817.69

\*\*\*\*\*

FLOW PROCESS FROM NODE 13830.00 TO NODE 13831.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 744.71

ELEVATION DATA: UPSTREAM(FEET) = 1100.95 DOWNSTREAM(FEET) = 959.21

Tc = K\*[LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.858  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.083  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	5.06	0.30	1.000	0	13.86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 12.68  
 TOTAL AREA(ACRES) = 5.06 PEAK FLOW RATE(CFS) = 12.68

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13831.00 TO NODE 13832.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 959.21 DOWNSTREAM(FEET) = 832.83  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1076.71 CHANNEL SLOPE = 0.1174  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.74  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.711  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	32.57	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 48.16  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.06  
 AVERAGE FLOW DEPTH(FEET) = 0.70 TRAVEL TIME(MIN.) = 2.96  
 Tc(MIN.) = 16.82  
 SUBAREA AREA(ACRES) = 32.57 SUBAREA RUNOFF(CFS) = 70.68  
 EFFECTIVE AREA(ACRES) = 37.63 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 37.6 PEAK FLOW RATE(CFS) = 81.66  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.95

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.95 FLOW VELOCITY(FEET/SEC.) = 7.23  
 LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13832.00 = 1821.42 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13832.00 TO NODE 13833.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 832.83 DOWNSTREAM(FEET) = 572.49  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1883.58 CHANNEL SLOPE = 0.1382  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.11  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.361  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	32.23	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 111.59  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.49  
 AVERAGE FLOW DEPTH(FEET) = 1.08 TRAVEL TIME(MIN.) = 3.70  
 Tc(MIN.) = 20.51  
 SUBAREA AREA(ACRES) = 32.23 SUBAREA RUNOFF(CFS) = 59.77  
 EFFECTIVE AREA(ACRES) = 69.86 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 69.9 PEAK FLOW RATE(CFS) = 129.56  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.18

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.18 FLOW VELOCITY(FEET/SEC.) = 8.90  
 LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13833.00 = 3705.00 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13833.00 TO NODE 13834.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 572.49 DOWNSTREAM(FEET) = 471.65  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 943.78 CHANNEL SLOPE = 0.1068  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.40  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.246  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	27.51	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 153.65  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.62  
 AVERAGE FLOW DEPTH(FEET) = 1.39 TRAVEL TIME(MIN.) = 1.82  
 Tc(MIN.) = 22.34  
 SUBAREA AREA(ACRES) = 27.51 SUBAREA RUNOFF(CFS) = 48.18  
 EFFECTIVE AREA(ACRES) = 97.37 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 97.4 PEAK FLOW RATE(CFS) = 170.51  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 1.48

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.48 FLOW VELOCITY(FEET/SEC.) = 8.91  
 LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13834.00 = 4648.78 FEET.



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FLOW PROCESS FROM NODE 13834.00 TO NODE 13835.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 471.65 DOWNSTREAM(FEET) = 347.06
CHANNEL LENGTH THRU SUBAREA(FEET) = 1647.45 CHANNEL SLOPE = 0.0756
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.02
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.058
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
LAND USE            GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -         94.21    0.30    1.000    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 245.10
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.82
AVERAGE FLOW DEPTH(FEET) = 1.99 TRAVEL TIME(MIN.) = 3.11
Tc(MIN.) = 25.45
SUBAREA AREA(ACRES) = 94.21 SUBAREA RUNOFF(CFS) = 149.07
EFFECTIVE AREA(ACRES) = 191.58 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 191.6 PEAK FLOW RATE(CFS) = 303.14
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 2.23

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.23 FLOW VELOCITY(FEET/SEC.) = 9.39
LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13835.00 = 6296.23 FEET.

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FLOW PROCESS FROM NODE 13835.00 TO NODE 13836.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 347.06 DOWNSTREAM(FEET) = 269.29
CHANNEL LENGTH THRU SUBAREA(FEET) = 1696.71 CHANNEL SLOPE = 0.0458
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.28
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.918
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
LAND USE            GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -         233.25  0.30    1.000    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 473.04
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.90
AVERAGE FLOW DEPTH(FEET) = 3.23 TRAVEL TIME(MIN.) = 3.18
Tc(MIN.) = 28.63
SUBAREA AREA(ACRES) = 233.25 SUBAREA RUNOFF(CFS) = 339.58
EFFECTIVE AREA(ACRES) = 424.83 AREA-AVERAGED Fm(INCH/HR) = 0.30

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AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 424.8 PEAK FLOW RATE(CFS) = 618.49
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 3.71

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.71 FLOW VELOCITY(FEET/SEC.) = 9.59
LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13836.00 = 7992.94 FEET.

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FLOW PROCESS FROM NODE 13836.00 TO NODE 13837.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 269.29 DOWNSTREAM(FEET) = 191.87
CHANNEL LENGTH THRU SUBAREA(FEET) = 2529.21 CHANNEL SLOPE = 0.0306
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 4.42
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.766
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
LAND USE            GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -         134.70  0.30    0.880    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.880
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 709.58
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.58
AVERAGE FLOW DEPTH(FEET) = 4.40 TRAVEL TIME(MIN.) = 4.91
Tc(MIN.) = 33.54
SUBAREA AREA(ACRES) = 134.70 SUBAREA RUNOFF(CFS) = 182.13
EFFECTIVE AREA(ACRES) = 559.53 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 559.5 PEAK FLOW RATE(CFS) = 742.79
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
*ESTIMATED CHANNEL HEIGHT(FEET) = 4.50

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 4.50 FLOW VELOCITY(FEET/SEC.) = 8.69
LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13837.00 = 10522.15 FEET.

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FLOW PROCESS FROM NODE 13837.00 TO NODE 13840.00 IS CODE = 31
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>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 191.87 DOWNSTREAM(FEET) = 133.00
FLOW LENGTH(FEET) = 1151.02 MANNING'S N = 0.013
DEPTH OF FLOW IN 69.0 INCH PIPE IS 51.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 35.42
ESTIMATED PIPE DIAMETER(INCH) = 69.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 742.79
PIPE TRAVEL TIME(MIN.) = 0.54 Tc(MIN.) = 34.08
LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13840.00 = 11673.17 FEET.

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\*\*\*\*\*  
FLOW PROCESS FROM NODE 13837.00 TO NODE 13840.00 IS CODE = 81

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

MAINLINE Tc(MIN.) = 34.08  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.752  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 5.97 0.30 0.622 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.622  
SUBAREA AREA(ACRES) = 5.97 SUBAREA RUNOFF(CFS) = 8.41  
EFFECTIVE AREA(ACRES) = 565.50 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA(ACRES) = 565.5 PEAK FLOW RATE(CFS) = 744.23

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13837.00 TO NODE 13840.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION(MIN.) = 34.08  
RAINFALL INTENSITY(INCH/HR) = 1.75  
AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.97  
EFFECTIVE STREAM AREA(ACRES) = 565.50  
TOTAL STREAM AREA(ACRES) = 565.50  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 744.23

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31467.17	22.25	2.251	0.30( 0.29)	0.96	5332.7	13810.00
1	35266.48	32.68	1.788	0.30( 0.29)	0.97	7943.6	10400.00
1	37424.73	38.50	1.639	0.30( 0.29)	0.97	10153.9	20700.00
1	40328.59	46.64	1.460	0.30( 0.29)	0.97	13651.9	10100.00
1	44093.89	57.18	1.306	0.30( 0.29)	0.97	19300.4	20100.00
1	45682.95	64.92	1.241	0.30( 0.29)	0.97	23629.4	31400.00
1	47399.18	74.44	1.176	0.30( 0.29)	0.96	28835.5	13100.00
1	48925.55	80.86	1.132	0.30( 0.29)	0.96	31940.2	11801.00
1	51060.93	90.03	1.070	0.30( 0.29)	0.97	36982.0	11530.00
1	52178.30	95.34	1.046	0.30( 0.29)	0.97	40630.5	13510.00
1	53201.00	100.39	1.023	0.30( 0.29)	0.97	43981.8	13010.00
1	54241.85	105.22	1.000	0.30( 0.29)	0.97	47230.2	11330.00
1	54817.69	111.47	0.972	0.30( 0.29)	0.97	51660.6	11130.00
1	54149.97	119.12	0.937	0.30( 0.29)	0.97	55650.8	12330.00
1	53433.48	125.83	0.918	0.30( 0.29)	0.97	58993.9	12400.00
1	52348.10	134.61	0.895	0.30( 0.29)	0.97	62361.3	12201.00
1	50798.95	144.11	0.870	0.30( 0.29)	0.98	64816.9	12101.10
1	50104.35	148.22	0.860	0.30( 0.29)	0.98	65667.6	10400.00
1	48242.70	156.45	0.838	0.30( 0.29)	0.98	66979.8	12010.00

1	46698.29	162.54	0.822	0.30( 0.29)	0.98	67296.3	10210.00
1	42215.96	189.23	0.766	0.30( 0.29)	0.98	68028.3	10100.00
2	744.23	34.08	1.752	0.30( 0.29)	0.97	565.5	13830.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	32118.73	22.25	2.251	0.30( 0.29)	0.96	5701.9	13810.00
2	35997.62	32.68	1.788	0.30( 0.29)	0.97	8485.9	10400.00
3	36530.46	34.08	1.752	0.30( 0.29)	0.97	9041.4	13830.00
4	38111.46	38.50	1.639	0.30( 0.29)	0.97	10719.4	20700.00
5	40924.07	46.64	1.460	0.30( 0.29)	0.97	14217.4	10100.00
6	44611.13	57.18	1.306	0.30( 0.29)	0.97	19865.9	20100.00
7	46166.65	64.92	1.241	0.30( 0.29)	0.97	24194.9	31400.00
8	47849.93	74.44	1.176	0.30( 0.29)	0.96	29401.0	13100.00
9	49354.07	80.86	1.132	0.30( 0.29)	0.96	32505.7	11801.00
10	51457.75	90.03	1.070	0.30( 0.29)	0.97	37547.5	11530.00
11	52562.78	95.34	1.046	0.30( 0.29)	0.97	41196.0	13510.00
12	53573.77	100.39	1.023	0.30( 0.29)	0.97	44547.3	13010.00
13	54603.37	105.22	1.000	0.30( 0.29)	0.97	47795.7	11330.00
14	55164.68	111.47	0.972	0.30( 0.29)	0.97	52226.1	11130.00
15	54479.20	119.12	0.937	0.30( 0.29)	0.97	56216.3	12330.00
16	53752.94	125.83	0.918	0.30( 0.29)	0.97	59559.4	12400.00
17	52655.94	134.61	0.895	0.30( 0.29)	0.97	62926.8	12201.00
18	51094.21	144.11	0.870	0.30( 0.29)	0.97	65382.4	12101.10
19	50394.18	148.22	0.860	0.30( 0.29)	0.98	66233.1	10400.00
20	48521.64	156.45	0.838	0.30( 0.29)	0.98	67545.2	12010.00
21	46969.17	162.54	0.822	0.30( 0.29)	0.98	67861.8	10210.00
22	42458.39	189.23	0.766	0.30( 0.29)	0.98	68593.8	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 55164.68 Tc(MIN.) = 111.47  
EFFECTIVE AREA(ACRES) = 52226.11 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA(ACRES) = 68593.8  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13840.00 = 132804.28 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13840.00 TO NODE 13860.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 133.00 DOWNSTREAM(FEET) = 130.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 654.44 CHANNEL SLOPE = 0.0046  
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 17.89  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 0.969  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 6.61 0.30 0.975 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.975

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 55166.70  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 17.97  
 AVERAGE FLOW DEPTH(FEET) = 17.89 TRAVEL TIME(MIN.) = 0.61  
 Tc(MIN.) = 112.08  
 SUBAREA AREA(ACRES) = 6.61 SUBAREA RUNOFF(CFS) = 4.03  
 EFFECTIVE AREA(ACRES) = 52232.72 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 68600.5 PEAK FLOW RATE(CFS) = 55164.68  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 17.89

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 17.89 FLOW VELOCITY(FEET/SEC.) = 17.97  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13860.00 = 133458.72 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13840.00 TO NODE 13860.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<  
 -----

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 112.08  
 RAINFALL INTENSITY(INCH/HR) = 0.97  
 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.97  
 EFFECTIVE STREAM AREA(ACRES) = 52232.72  
 TOTAL STREAM AREA(ACRES) = 68600.45  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 55164.68

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13850.00 TO NODE 13851.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
 -----

INITIAL SUBAREA FLOW-LENGTH(FEET) = 617.57  
 ELEVATION DATA: UPSTREAM(FEET) = 646.95 DOWNSTREAM(FEET) = 490.10

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.137  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.371  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	4.95	0.30	1.000	0	12.14

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 13.68  
 TOTAL AREA(ACRES) = 4.95 PEAK FLOW RATE(CFS) = 13.68

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13851.00 TO NODE 13851.50 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<  
 -----

ELEVATION DATA: UPSTREAM(FEET) = 490.10 DOWNSTREAM(FEET) = 440.98  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 351.14 CHANNEL SLOPE = 0.1399  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.38  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.160

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	4.02	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.85  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.63  
 AVERAGE FLOW DEPTH(FEET) = 0.38 TRAVEL TIME(MIN.) = 1.26  
 Tc(MIN.) = 13.40

SUBAREA AREA(ACRES) = 4.02 SUBAREA RUNOFF(CFS) = 10.35  
 EFFECTIVE AREA(ACRES) = 8.97 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 9.0 PEAK FLOW RATE(CFS) = 23.09  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.43

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.43 FLOW VELOCITY(FEET/SEC.) = 4.94  
 LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13851.50 = 968.71 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13851.50 TO NODE 13852.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<  
 -----

ELEVATION DATA: UPSTREAM(FEET) = 440.98 DOWNSTREAM(FEET) = 395.76  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 512.91 CHANNEL SLOPE = 0.0882  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.60  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.873

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	7.17	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.40  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.76  
 AVERAGE FLOW DEPTH(FEET) = 0.59 TRAVEL TIME(MIN.) = 1.80  
 Tc(MIN.) = 15.20

SUBAREA AREA(ACRES) = 7.17 SUBAREA RUNOFF(CFS) = 16.60  
 EFFECTIVE AREA(ACRES) = 16.14 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 16.1 PEAK FLOW RATE(CFS) = 37.38  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.65  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.65 FLOW VELOCITY (FEET/SEC.) = 5.06  
 LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13852.00 = 1481.62 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13852.00 TO NODE 13853.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 395.76 DOWNSTREAM (FEET) = 354.94  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 443.69 CHANNEL SLOPE = 0.0920  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.72  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.738  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	6.76	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 44.80  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.49  
 AVERAGE FLOW DEPTH (FEET) = 0.71 TRAVEL TIME (MIN.) = 1.35  
 Tc (MIN.) = 16.55  
 SUBAREA AREA (ACRES) = 6.76 SUBAREA RUNOFF (CFS) = 14.84  
 EFFECTIVE AREA (ACRES) = 22.90 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 22.9 PEAK FLOW RATE (CFS) = 50.26  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.77

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.77 FLOW VELOCITY (FEET/SEC.) = 5.69  
 LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13853.00 = 1925.31 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13853.00 TO NODE 13854.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 354.94 DOWNSTREAM (FEET) = 263.57  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 962.09 CHANNEL SLOPE = 0.0950  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.92  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.487  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.16	0.30	1.000	-

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

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 68.15  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.38  
 AVERAGE FLOW DEPTH (FEET) = 0.91 TRAVEL TIME (MIN.) = 2.51  
 Tc (MIN.) = 19.06  
 SUBAREA AREA (ACRES) = 18.16 SUBAREA RUNOFF (CFS) = 35.74  
 EFFECTIVE AREA (ACRES) = 41.06 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 41.1 PEAK FLOW RATE (CFS) = 80.82  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.00

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.00 FLOW VELOCITY (FEET/SEC.) = 6.72  
 LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13854.00 = 2887.40 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13854.00 TO NODE 13855.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 263.57 DOWNSTREAM (FEET) = 188.74  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1228.77 CHANNEL SLOPE = 0.0609  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.41  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.254  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	38.75	0.30	0.879	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.879  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 115.55  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.50  
 AVERAGE FLOW DEPTH (FEET) = 1.39 TRAVEL TIME (MIN.) = 3.15  
 Tc (MIN.) = 22.21  
 SUBAREA AREA (ACRES) = 38.75 SUBAREA RUNOFF (CFS) = 69.40  
 EFFECTIVE AREA (ACRES) = 79.81 AREA-AVERAGED Fm (INCH/HR) = 0.28  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.94  
 TOTAL AREA (ACRES) = 79.8 PEAK FLOW RATE (CFS) = 141.59  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.56

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.56 FLOW VELOCITY (FEET/SEC.) = 6.92  
 LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13855.00 = 4116.17 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13855.00 TO NODE 13860.00 IS CODE = 31  
 -----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 188.74 DOWNSTREAM (FEET) = 130.00

FLOW LENGTH(FEET) = 2092.67 MANNING'S N = 0.013  
 DEPTH OF FLOW IN 42.0 INCH PIPE IS 30.7 INCHES  
 PIPE-FLOW VELOCITY(FEET/SEC.) = 18.77  
 ESTIMATED PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1  
 PIPE-FLOW(CFS) = 141.59  
 PIPE TRAVEL TIME(MIN.) = 1.86 Tc(MIN.) = 24.07  
 LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13860.00 = 6208.84 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13855.00 TO NODE 13860.00 IS CODE = 81  
 -----

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

=====

MAINLINE Tc(MIN.) = 24.07  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.136  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	43.41	0.30	0.707	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.707  
 SUBAREA AREA(ACRES) = 43.41 SUBAREA RUNOFF(CFS) = 75.19  
 EFFECTIVE AREA(ACRES) = 123.22 AREA-AVERAGED Fm(INCH/HR) = 0.26  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.86  
 TOTAL AREA(ACRES) = 123.2 PEAK FLOW RATE(CFS) = 208.37

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13855.00 TO NODE 13860.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 24.07  
 RAINFALL INTENSITY(INCH/HR) = 2.14  
 AREA-AVERAGED Fm(INCH/HR) = 0.26  
 AREA-AVERAGED Fp(INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.86  
 EFFECTIVE STREAM AREA(ACRES) = 123.22  
 TOTAL STREAM AREA(ACRES) = 123.22  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 208.37

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	32118.73	22.96	2.207	0.30( 0.29)	0.96	5708.5	13810.00
1	35997.62	33.37	1.771	0.30( 0.29)	0.97	8492.5	10400.00
1	36530.46	34.77	1.735	0.30( 0.29)	0.97	9048.0	13830.00
1	38111.46	39.17	1.622	0.30( 0.29)	0.97	10726.1	20700.00
1	40924.07	47.30	1.446	0.30( 0.29)	0.97	14224.0	10100.00
1	44611.13	57.82	1.299	0.30( 0.29)	0.97	19872.5	20100.00
1	46166.65	65.56	1.236	0.30( 0.29)	0.97	24201.5	31400.00
1	47849.93	75.07	1.172	0.30( 0.29)	0.96	29407.6	13100.00
1	49354.07	81.49	1.128	0.30( 0.29)	0.96	32512.3	11801.00
1	51457.75	90.65	1.067	0.30( 0.29)	0.97	37554.1	11530.00
1	52562.78	95.96	1.043	0.30( 0.29)	0.97	41202.7	13510.00
1	53573.77	101.00	1.020	0.30( 0.29)	0.97	44553.9	13010.00

1	54603.37	105.83	0.998	0.30( 0.29)	0.97	47802.4	11330.00
1	55164.68	112.08	0.969	0.30( 0.29)	0.97	52232.7	11130.00
1	54479.20	119.72	0.934	0.30( 0.29)	0.97	56222.9	12330.00
1	53752.94	126.44	0.916	0.30( 0.29)	0.97	59566.0	12400.00
1	52655.94	135.22	0.893	0.30( 0.29)	0.97	62933.4	12201.00
1	51094.21	144.74	0.869	0.30( 0.29)	0.97	65389.0	12101.10
1	50394.18	148.84	0.858	0.30( 0.29)	0.98	66239.7	10400.00
1	48521.64	157.08	0.837	0.30( 0.29)	0.98	67551.9	12010.00
1	46969.17	163.18	0.821	0.30( 0.29)	0.98	67868.4	10210.00
1	42458.39	189.88	0.766	0.30( 0.29)	0.98	68600.5	10100.00
2	208.37	24.07	2.136	0.30( 0.26)	0.86	123.2	13850.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	32324.88	22.96	2.207	0.30( 0.29)	0.96	5826.0	13810.00
2	32741.74	24.07	2.136	0.30( 0.29)	0.96	6129.3	13850.00
3	36165.43	33.37	1.771	0.30( 0.29)	0.97	8615.7	10400.00
4	36694.31	34.77	1.735	0.30( 0.29)	0.97	9171.2	13830.00
5	38262.80	39.17	1.622	0.30( 0.29)	0.97	10849.3	20700.00
6	41055.88	47.30	1.446	0.30( 0.29)	0.97	14347.3	10100.00
7	44726.63	57.82	1.299	0.30( 0.29)	0.97	19995.7	20100.00
8	46275.18	65.56	1.236	0.30( 0.29)	0.97	24324.8	31400.00
9	47951.29	75.07	1.172	0.30( 0.29)	0.96	29530.8	13100.00
10	49450.59	81.49	1.128	0.30( 0.29)	0.96	32635.5	11801.00
11	51547.52	90.65	1.067	0.30( 0.29)	0.97	37677.3	11530.00
12	52649.86	95.96	1.043	0.30( 0.29)	0.97	41325.9	13510.00
13	53658.29	101.00	1.020	0.30( 0.29)	0.97	44677.1	13010.00
14	54685.45	105.83	0.998	0.30( 0.29)	0.97	47925.6	11330.00
15	55243.60	112.08	0.969	0.30( 0.29)	0.97	52355.9	11130.00
16	54554.25	119.72	0.934	0.30( 0.29)	0.97	56346.2	12330.00
17	53825.99	126.44	0.916	0.30( 0.29)	0.97	59689.2	12400.00
18	52726.46	135.22	0.893	0.30( 0.29)	0.97	63056.6	12201.00
19	51161.98	144.74	0.869	0.30( 0.29)	0.97	65512.2	12101.10
20	50460.77	148.84	0.858	0.30( 0.29)	0.98	66363.0	10400.00
21	48585.86	157.08	0.837	0.30( 0.29)	0.98	67675.1	12010.00
22	47031.62	163.18	0.821	0.30( 0.29)	0.98	67991.6	10210.00
23	42514.74	189.88	0.766	0.30( 0.29)	0.98	68723.7	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 55243.60 Tc(MIN.) = 112.08  
 EFFECTIVE AREA(ACRES) = 52355.94 AREA-AVERAGED Fm(INCH/HR) = 0.29  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 68723.7  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13860.00 = 133458.72 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13860.00 TO NODE 13880.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 130.00 DOWNSTREAM(FEET) = 120.57  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 610.77 CHANNEL SLOPE = 0.0154  
 GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 13.07  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 0.968  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	4.89	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 55245.07  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 27.77  
 AVERAGE FLOW DEPTH (FEET) = 13.07 TRAVEL TIME (MIN.) = 0.37  
 Tc (MIN.) = 112.44  
 SUBAREA AREA (ACRES) = 4.89 SUBAREA RUNOFF (CFS) = 2.94  
 EFFECTIVE AREA (ACRES) = 52360.83 AREA-AVERAGED Fm (INCH/HR) = 0.29  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA (ACRES) = 68728.6 PEAK FLOW RATE (CFS) = 55243.60  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 GIVEN CHANNEL BASE (FEET) = 100.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 13.07

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 13.07 FLOW VELOCITY (FEET/SEC.) = 27.77  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13880.00 = 134069.48 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13860.00 TO NODE 13880.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

-----  
 TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION (MIN.) = 112.44  
 RAINFALL INTENSITY (INCH/HR) = 0.97  
 AREA-AVERAGED Fm (INCH/HR) = 0.29  
 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.97  
 EFFECTIVE STREAM AREA (ACRES) = 52360.83  
 TOTAL STREAM AREA (ACRES) = 68728.56  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 55243.60

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13870.00 TO NODE 13871.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 872.65  
 ELEVATION DATA: UPSTREAM (FEET) = 558.52 DOWNSTREAM (FEET) = 436.47

Tc = K \* [(LENGTH\*\* 3.00) / (ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 15.704  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.823

SUBAREA Tc AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER	-					

"GRASS" - 9.32 0.30 1.000 0 15.70  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF (CFS) = 21.16  
 TOTAL AREA (ACRES) = 9.32 PEAK FLOW RATE (CFS) = 21.16

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13871.00 TO NODE 13872.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
 ELEVATION DATA: UPSTREAM (FEET) = 436.47 DOWNSTREAM (FEET) = 337.62  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 827.95 CHANNEL SLOPE = 0.1194  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.60  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.572

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	14.27	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 35.77  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.50  
 AVERAGE FLOW DEPTH (FEET) = 0.58 TRAVEL TIME (MIN.) = 2.51  
 Tc (MIN.) = 18.21

SUBAREA AREA (ACRES) = 14.27 SUBAREA RUNOFF (CFS) = 29.18  
 EFFECTIVE AREA (ACRES) = 23.59 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 23.6 PEAK FLOW RATE (CFS) = 48.23  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.69

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.69 FLOW VELOCITY (FEET/SEC.) = 6.13  
 LONGEST FLOWPATH FROM NODE 13870.00 TO NODE 13872.00 = 1700.60 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13872.00 TO NODE 13873.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
 ELEVATION DATA: UPSTREAM (FEET) = 337.62 DOWNSTREAM (FEET) = 253.88  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1049.16 CHANNEL SLOPE = 0.0798  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.08  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.332

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	35.74	0.30	0.923	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.923

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 81.33  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.36  
AVERAGE FLOW DEPTH(FEET) = 1.06 TRAVEL TIME(MIN.) = 2.75  
Tc(MIN.) = 20.96  
SUBAREA AREA(ACRES) = 35.74 SUBAREA RUNOFF(CFS) = 66.12  
EFFECTIVE AREA(ACRES) = 59.33 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.95  
TOTAL AREA(ACRES) = 59.3 PEAK FLOW RATE(CFS) = 109.27  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.25

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.25 FLOW VELOCITY(FEET/SEC.) = 7.00  
LONGEST FLOWPATH FROM NODE 13870.00 TO NODE 13873.00 = 2749.76 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13873.00 TO NODE 13874.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 253.88 DOWNSTREAM(FEET) = 160.73  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1518.60 CHANNEL SLOPE = 0.0613  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.23  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.156

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 32.43 0.30 0.900 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.900  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 136.81  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.05  
AVERAGE FLOW DEPTH(FEET) = 1.22 TRAVEL TIME(MIN.) = 2.80  
Tc(MIN.) = 23.76

SUBAREA AREA(ACRES) = 32.43 SUBAREA RUNOFF(CFS) = 55.05  
EFFECTIVE AREA(ACRES) = 91.76 AREA-AVERAGED Fm(INCH/HR) = 0.28  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.93  
TOTAL AREA(ACRES) = 91.8 PEAK FLOW RATE(CFS) = 154.92  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.30

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.30 FLOW VELOCITY(FEET/SEC.) = 9.44  
LONGEST FLOWPATH FROM NODE 13870.00 TO NODE 13874.00 = 4268.36 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13874.00 TO NODE 13875.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 160.73 DOWNSTREAM(FEET) = 158.14  
CHANNEL LENGTH THRU SUBAREA(FEET) = 582.74 CHANNEL SLOPE = 0.0044

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.20  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.028

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 73.67 0.30 0.930 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.930  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 212.94  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.11  
AVERAGE FLOW DEPTH(FEET) = 3.17 TRAVEL TIME(MIN.) = 2.36  
Tc(MIN.) = 26.12

SUBAREA AREA(ACRES) = 73.67 SUBAREA RUNOFF(CFS) = 116.00  
EFFECTIVE AREA(ACRES) = 165.43 AREA-AVERAGED Fm(INCH/HR) = 0.28  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.93  
TOTAL AREA(ACRES) = 165.4 PEAK FLOW RATE(CFS) = 260.37  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.51

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.51 FLOW VELOCITY(FEET/SEC.) = 4.35  
LONGEST FLOWPATH FROM NODE 13870.00 TO NODE 13875.00 = 4851.10 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13875.00 TO NODE 13880.00 IS CODE = 31

-----  
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 158.14 DOWNSTREAM(FEET) = 120.57  
FLOW LENGTH(FEET) = 1855.67 MANNING'S N = 0.013  
DEPTH OF FLOW IN 54.0 INCH PIPE IS 43.4 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 19.02  
ESTIMATED PIPE DIAMETER(INCH) = 54.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 260.37  
PIPE TRAVEL TIME(MIN.) = 1.63 Tc(MIN.) = 27.75  
LONGEST FLOWPATH FROM NODE 13870.00 TO NODE 13880.00 = 6706.77 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13875.00 TO NODE 13880.00 IS CODE = 81

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

-----  
MAINLINE Tc(MIN.) = 27.75  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.957  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 34.90 0.30 0.743 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.743  
SUBAREA AREA(ACRES) = 34.90 SUBAREA RUNOFF(CFS) = 54.46  
EFFECTIVE AREA(ACRES) = 200.33 AREA-AVERAGED Fm(INCH/HR) = 0.27  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.90  
TOTAL AREA(ACRES) = 200.3 PEAK FLOW RATE(CFS) = 304.13

\*\*\*\*\*

FLOW PROCESS FROM NODE 13875.00 TO NODE 13880.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 27.75
RAINFALL INTENSITY(INCH/HR) = 1.96
AREA-AVERAGED Fm(INCH/HR) = 0.27
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.90
EFFECTIVE STREAM AREA(ACRES) = 200.33
TOTAL STREAM AREA(ACRES) = 200.33
PEAK FLOW RATE(CFS) AT CONFLUENCE = 304.13

\*\* CONFLUENCE DATA \*\*

Table with columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 20 rows of data.

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

\*\* PEAK FLOW RATE TABLE \*\*

Table with columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 6 rows of data.

Table with columns: Node number, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 18 rows of data.

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 55369.39 Tc(MIN.) = 112.44
EFFECTIVE AREA(ACRES) = 52561.16 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 68928.9
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13880.00 = 134069.48 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13880.00 TO NODE 13910.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 120.57 DOWNSTREAM(FEET) = 119.70
CHANNEL LENGTH THRU SUBAREA(FEET) = 1190.21 CHANNEL SLOPE = 0.0007
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030
\*ESTIMATED CHANNEL HEIGHT(FEET) = 28.23
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 0.958
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCSSOIL AREA Fp Ap SCSS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 117.69 0.30 0.724 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.724
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 55408.61
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.22
AVERAGE FLOW DEPTH(FEET) = 28.23 TRAVEL TIME(MIN.) = 2.15
Tc(MIN.) = 114.60

SUBAREA AREA(ACRES) = 117.69 SUBAREA RUNOFF(CFS) = 78.44
EFFECTIVE AREA(ACRES) = 52678.85 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 69046.6 PEAK FLOW RATE(CFS) = 55369.39
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030
\*ESTIMATED CHANNEL HEIGHT(FEET) = 28.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:



DEPTH(FEET) = 28.22 FLOW VELOCITY(FEET/SEC.) = 9.22  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13910.00 = 135259.69 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13880.00 TO NODE 13910.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 114.60  
RAINFALL INTENSITY(INCH/HR) = 0.96  
AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30  
AREA-AVERAGED Ap = 0.97  
EFFECTIVE STREAM AREA(ACRES) = 52678.85  
TOTAL STREAM AREA(ACRES) = 69046.58  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 55369.39

\*\*\*\*\*

FLOW PROCESS FROM NODE 13889.00 TO NODE 13890.00 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 447.89  
ELEVATION DATA: UPSTREAM(FEET) = 564.89 DOWNSTREAM(FEET) = 421.92

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 6.976  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.950  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS	Tc
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN	(MIN.)
PUBLIC PARK	-	3.03	0.30	0.960	0	6.98

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.960  
SUBAREA RUNOFF(CFS) = 12.71  
TOTAL AREA(ACRES) = 3.03 PEAK FLOW RATE(CFS) = 12.71

\*\*\*\*\*

FLOW PROCESS FROM NODE 13890.00 TO NODE 13891.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 421.92 DOWNSTREAM(FEET) = 392.64  
CHANNEL LENGTH THRU SUBAREA(FEET) = 435.33 CHANNEL SLOPE = 0.0673  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.49  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.409  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	8.12	0.30	0.986	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.986

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 27.80  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.43  
AVERAGE FLOW DEPTH(FEET) = 0.47 TRAVEL TIME(MIN.) = 1.34  
Tc(MIN.) = 8.31  
SUBAREA AREA(ACRES) = 8.12 SUBAREA RUNOFF(CFS) = 30.06  
EFFECTIVE AREA(ACRES) = 11.15 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.98  
TOTAL AREA(ACRES) = 11.1 PEAK FLOW RATE(CFS) = 41.30  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.59

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.59 FLOW VELOCITY(FEET/SEC.) = 6.26  
LONGEST FLOWPATH FROM NODE 13889.00 TO NODE 13891.00 = 883.22 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13891.00 TO NODE 13892.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 392.64 DOWNSTREAM(FEET) = 324.46  
CHANNEL LENGTH THRU SUBAREA(FEET) = 662.40 CHANNEL SLOPE = 0.1029  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.68  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.867  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	12.50	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 61.43  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.24  
AVERAGE FLOW DEPTH(FEET) = 0.66 TRAVEL TIME(MIN.) = 1.34  
Tc(MIN.) = 9.65  
SUBAREA AREA(ACRES) = 12.50 SUBAREA RUNOFF(CFS) = 40.13  
EFFECTIVE AREA(ACRES) = 23.65 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 23.6 PEAK FLOW RATE(CFS) = 76.00  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.74

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.74 FLOW VELOCITY(FEET/SEC.) = 8.88  
LONGEST FLOWPATH FROM NODE 13889.00 TO NODE 13892.00 = 1545.62 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13892.00 TO NODE 13893.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 324.46 DOWNSTREAM(FEET) = 240.82  
CHANNEL LENGTH THRU SUBAREA(FEET) = 980.03 CHANNEL SLOPE = 0.0853

GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.93  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.485  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	15.87	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 98.76  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.08  
 AVERAGE FLOW DEPTH (FEET) = 0.92 TRAVEL TIME (MIN.) = 1.80  
 Tc (MIN.) = 11.45  
 SUBAREA AREA (ACRES) = 15.87 SUBAREA RUNOFF (CFS) = 45.49  
 EFFECTIVE AREA (ACRES) = 39.52 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 39.5 PEAK FLOW RATE (CFS) = 113.35  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 0.99

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.99 FLOW VELOCITY (FEET/SEC.) = 9.50  
 LONGEST FLOWPATH FROM NODE 13889.00 TO NODE 13893.00 = 2525.65 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13893.00 TO NODE 13894.00 IS CODE = 56  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 -----

ELEVATION DATA: UPSTREAM (FEET) = 240.82 DOWNSTREAM (FEET) = 163.04  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1144.35 CHANNEL SLOPE = 0.0680  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.26  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.156  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	28.41	0.30	0.985	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.985  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 149.96  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.68  
 AVERAGE FLOW DEPTH (FEET) = 1.24 TRAVEL TIME (MIN.) = 1.97  
 Tc (MIN.) = 13.42  
 SUBAREA AREA (ACRES) = 28.41 SUBAREA RUNOFF (CFS) = 73.15  
 EFFECTIVE AREA (ACRES) = 67.93 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 67.9 PEAK FLOW RATE (CFS) = 174.82  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 1.36

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.36 FLOW VELOCITY (FEET/SEC.) = 10.15

LONGEST FLOWPATH FROM NODE 13889.00 TO NODE 13894.00 = 3670.00 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13894.00 TO NODE 13910.00 IS CODE = 31  
 -----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<  
 -----

ELEVATION DATA: UPSTREAM (FEET) = 163.04 DOWNSTREAM (FEET) = 119.70  
 FLOW LENGTH (FEET) = 1899.01 MANNING'S N = 0.013  
 DEPTH OF FLOW IN 48.0 INCH PIPE IS 34.0 INCHES  
 PIPE-FLOW VELOCITY (FEET/SEC.) = 18.39  
 ESTIMATED PIPE DIAMETER (INCH) = 48.00 NUMBER OF PIPES = 1  
 PIPE-FLOW (CFS) = 174.82  
 PIPE TRAVEL TIME (MIN.) = 1.72 Tc (MIN.) = 15.14  
 LONGEST FLOWPATH FROM NODE 13889.00 TO NODE 13910.00 = 5569.01 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13894.00 TO NODE 13910.00 IS CODE = 81  
 -----

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

MAINLINE Tc (MIN.) = 15.14  
 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.879  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	11.69	0.30	0.634	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.634  
 SUBAREA AREA (ACRES) = 11.69 SUBAREA RUNOFF (CFS) = 28.29  
 EFFECTIVE AREA (ACRES) = 79.62 AREA-AVERAGED Fm (INCH/HR) = 0.28  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.94  
 TOTAL AREA (ACRES) = 79.6 PEAK FLOW RATE (CFS) = 186.13

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13894.00 TO NODE 13910.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<  
 -----

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION (MIN.) = 15.14  
 RAINFALL INTENSITY (INCH/HR) = 2.88  
 AREA-AVERAGED Fm (INCH/HR) = 0.28  
 AREA-AVERAGED Fp (INCH/HR) = 0.30  
 AREA-AVERAGED Ap = 0.94  
 EFFECTIVE STREAM AREA (ACRES) = 79.62  
 TOTAL STREAM AREA (ACRES) = 79.62  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 186.13

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	32615.12	25.87	2.040	0.30 ( 0.29)	0.96	6117.5	13810.00
1	33034.63	26.97	1.991	0.30 ( 0.29)	0.96	6428.8	13850.00
1	34242.88	30.19	1.852	0.30 ( 0.29)	0.96	7321.5	13870.00

1	36434.13	36.19	1.699	0.30 ( 0.29)	0.96	8938.6	10400.00
1	36956.57	37.58	1.663	0.30 ( 0.29)	0.96	9494.1	13830.00
1	38504.75	41.95	1.560	0.30 ( 0.29)	0.96	11172.2	20700.00
1	41266.45	50.03	1.389	0.30 ( 0.29)	0.97	14670.2	10100.00
1	44911.39	60.49	1.271	0.30 ( 0.29)	0.97	20318.6	20100.00
1	46448.95	68.20	1.218	0.30 ( 0.29)	0.96	24647.7	31400.00
1	48113.40	77.69	1.154	0.30 ( 0.29)	0.96	29853.7	13100.00
1	49604.83	84.08	1.110	0.30 ( 0.29)	0.96	32958.4	11801.00
1	51690.95	93.21	1.055	0.30 ( 0.29)	0.96	38000.2	11530.00
1	52788.92	98.51	1.031	0.30 ( 0.29)	0.97	41648.8	13510.00
1	53793.21	103.54	1.008	0.30 ( 0.29)	0.97	45000.0	13010.00
1	54816.39	108.36	0.986	0.30 ( 0.29)	0.97	48248.5	11330.00
1	55369.39	114.60	0.958	0.30 ( 0.29)	0.97	52678.9	11130.00
1	54673.77	122.25	0.927	0.30 ( 0.29)	0.97	56669.1	12330.00
1	53942.37	128.98	0.910	0.30 ( 0.29)	0.97	60012.1	12400.00
1	52838.72	137.77	0.887	0.30 ( 0.29)	0.97	63379.5	12201.00
1	51269.78	147.31	0.862	0.30 ( 0.29)	0.97	65835.1	12101.10
1	50566.65	151.42	0.851	0.30 ( 0.29)	0.97	66685.9	10400.00
1	48687.87	159.68	0.830	0.30 ( 0.29)	0.97	67998.0	12010.00
1	47130.78	165.81	0.814	0.30 ( 0.29)	0.97	68314.5	10210.00
1	42604.08	192.58	0.763	0.30 ( 0.29)	0.98	69046.6	10100.00
2	186.13	15.14	2.879	0.30 ( 0.28)	0.94	79.6	13889.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	28417.02	15.14	2.879	0.30 ( 0.29)	0.96	3660.5	13889.00
2	32741.12	25.87	2.040	0.30 ( 0.29)	0.96	6197.1	13810.00
3	33157.14	26.97	1.991	0.30 ( 0.29)	0.96	6508.4	13850.00
4	34355.43	30.19	1.852	0.30 ( 0.29)	0.96	7401.2	13870.00
5	36535.68	36.19	1.699	0.30 ( 0.29)	0.96	9018.2	10400.00
6	37055.58	37.58	1.663	0.30 ( 0.29)	0.96	9573.8	13830.00
7	38596.35	41.95	1.560	0.30 ( 0.29)	0.96	11251.8	20700.00
8	41345.80	50.03	1.389	0.30 ( 0.29)	0.97	14749.8	10100.00
9	44982.29	60.49	1.271	0.30 ( 0.29)	0.97	20398.2	20100.00
10	46516.09	68.20	1.218	0.30 ( 0.29)	0.96	24727.3	31400.00
11	48175.91	77.69	1.154	0.30 ( 0.29)	0.96	29933.3	13100.00
12	49664.23	84.08	1.110	0.30 ( 0.29)	0.96	33038.0	11801.00
13	51746.42	93.21	1.055	0.30 ( 0.29)	0.96	38079.8	11530.00
14	52842.65	98.51	1.031	0.30 ( 0.29)	0.97	41728.4	13510.00
15	53845.29	103.54	1.008	0.30 ( 0.29)	0.97	45079.6	13010.00
16	54866.89	108.36	0.986	0.30 ( 0.29)	0.97	48328.1	11330.00
17	55417.86	114.60	0.958	0.30 ( 0.29)	0.97	52758.5	11130.00
18	54720.05	122.25	0.927	0.30 ( 0.29)	0.97	56748.7	12330.00
19	53987.39	128.98	0.910	0.30 ( 0.29)	0.97	60091.8	12400.00
20	52882.11	137.77	0.887	0.30 ( 0.29)	0.97	63459.1	12201.00
21	51311.39	147.31	0.862	0.30 ( 0.29)	0.97	65914.8	12101.10
22	50607.49	151.42	0.851	0.30 ( 0.29)	0.97	66765.5	10400.00
23	48727.17	159.68	0.830	0.30 ( 0.29)	0.97	68077.6	12010.00
24	47168.94	165.81	0.814	0.30 ( 0.29)	0.97	68394.2	10210.00
25	42638.57	192.58	0.763	0.30 ( 0.29)	0.98	69126.2	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 55417.86 Tc(MIN.) = 114.60  
EFFECTIVE AREA(ACRES) = 52758.47 AREA-AVERAGED Fm(INCH/HR) = 0.29

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA(ACRES) = 69126.2  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13910.00 = 135259.69 FEET.  
=====

END OF STUDY SUMMARY:  
TOTAL AREA(ACRES) = 69126.2 TC(MIN.) = 114.60  
EFFECTIVE AREA(ACRES) = 52758.47 AREA-AVERAGED Fm(INCH/HR) = 0.29  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.971  
PEAK FLOW RATE(CFS) = 55417.86

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	28417.02	15.14	2.879	0.30 ( 0.29)	0.96	3660.5	13889.00
2	32741.12	25.87	2.040	0.30 ( 0.29)	0.96	6197.1	13810.00
3	33157.14	26.97	1.991	0.30 ( 0.29)	0.96	6508.4	13850.00
4	34355.43	30.19	1.852	0.30 ( 0.29)	0.96	7401.2	13870.00
5	36535.68	36.19	1.699	0.30 ( 0.29)	0.96	9018.2	10400.00
6	37055.58	37.58	1.663	0.30 ( 0.29)	0.96	9573.8	13830.00
7	38596.35	41.95	1.560	0.30 ( 0.29)	0.96	11251.8	20700.00
8	41345.80	50.03	1.389	0.30 ( 0.29)	0.97	14749.8	10100.00
9	44982.29	60.49	1.271	0.30 ( 0.29)	0.97	20398.2	20100.00
10	46516.09	68.20	1.218	0.30 ( 0.29)	0.96	24727.3	31400.00
11	48175.91	77.69	1.154	0.30 ( 0.29)	0.96	29933.3	13100.00
12	49664.23	84.08	1.110	0.30 ( 0.29)	0.96	33038.0	11801.00
13	51746.42	93.21	1.055	0.30 ( 0.29)	0.96	38079.8	11530.00
14	52842.65	98.51	1.031	0.30 ( 0.29)	0.97	41728.4	13510.00
15	53845.29	103.54	1.008	0.30 ( 0.29)	0.97	45079.6	13010.00
16	54866.89	108.36	0.986	0.30 ( 0.29)	0.97	48328.1	11330.00
17	55417.86	114.60	0.958	0.30 ( 0.29)	0.97	52758.5	11130.00
18	54720.05	122.25	0.927	0.30 ( 0.29)	0.97	56748.7	12330.00
19	53987.39	128.98	0.910	0.30 ( 0.29)	0.97	60091.8	12400.00
20	52882.11	137.77	0.887	0.30 ( 0.29)	0.97	63459.1	12201.00
21	51311.39	147.31	0.862	0.30 ( 0.29)	0.97	65914.8	12101.10
22	50607.49	151.42	0.851	0.30 ( 0.29)	0.97	66765.5	10400.00
23	48727.17	159.68	0.830	0.30 ( 0.29)	0.97	68077.6	12010.00
24	47168.94	165.81	0.814	0.30 ( 0.29)	0.97	68394.2	10210.00
25	42638.57	192.58	0.763	0.30 ( 0.29)	0.98	69126.2	10100.00

=====

END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2013 Advanced Engineering Software (aes)  
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

Michael Baker International  
5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

-----  
FILE NAME: S39.DAT  
TIME/DATE OF STUDY: 11:06 07/16/2018  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 5.744
- 2) 10.00; 3.724
- 3) 15.00; 2.891
- 4) 20.00; 2.392
- 5) 25.00; 2.077
- 6) 30.00; 1.856
- 7) 40.00; 1.601
- 8) 50.00; 1.389
- 9) 60.00; 1.273
- 10) 90.00; 1.070
- 11) 120.00; 0.932
- 12) 180.00; 0.777
- 13) 360.00; 0.571
- 14) 1440.00; 0.248

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR	STREET MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 13900.00 TO NODE 13901.00 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 600.65  
ELEVATION DATA: UPSTREAM(FEET) = 442.40 DOWNSTREAM(FEET) = 385.16

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.859  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.581  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
AGRICULTURAL POOR COVER "FALLOW"	-	4.00	0.30	1.000	0	10.86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 11.81  
 TOTAL AREA(ACRES) = 4.00 PEAK FLOW RATE(CFS) = 11.81

\*\*\*\*\*

FLOW PROCESS FROM NODE 13901.00 TO NODE 13902.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 385.16 DOWNSTREAM(FEET) = 288.21  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 647.42 CHANNEL SLOPE = 0.1497  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.34  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.307  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	8.47	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 23.29  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.56  
 AVERAGE FLOW DEPTH(FEET) = 0.33 TRAVEL TIME(MIN.) = 1.64  
 Tc(MIN.) = 12.50  
 SUBAREA AREA(ACRES) = 8.47 SUBAREA RUNOFF(CFS) = 22.92  
 EFFECTIVE AREA(ACRES) = 12.47 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 12.5 PEAK FLOW RATE(CFS) = 33.75  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 0.41

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.41 FLOW VELOCITY(FEET/SEC.) = 7.51  
 LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13902.00 = 1248.07 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13902.00 TO NODE 13903.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 288.21 DOWNSTREAM(FEET) = 184.89  
CHANNEL LENGTH THRU SUBAREA(FEET) = 669.27 CHANNEL SLOPE = 0.1544  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.61  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.113  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 23.85 0.30 0.982 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.982  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 64.02  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.56  
AVERAGE FLOW DEPTH(FEET) = 0.60 TRAVEL TIME(MIN.) = 1.17  
Tc(MIN.) = 13.67  
SUBAREA AREA(ACRES) = 23.85 SUBAREA RUNOFF(CFS) = 60.49  
EFFECTIVE AREA(ACRES) = 36.32 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 36.3 PEAK FLOW RATE(CFS) = 92.06  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.040  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.74

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.74 FLOW VELOCITY(FEET/SEC.) = 10.79  
LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13903.00 = 1917.34 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13903.00 TO NODE 13904.00 IS CODE = 31  
-----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 184.89 DOWNSTREAM(FEET) = 155.08  
FLOW LENGTH(FEET) = 876.66 MANNING'S N = 0.013  
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000  
DEPTH OF FLOW IN 36.0 INCH PIPE IS 24.1 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 18.29  
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 92.06  
PIPE TRAVEL TIME(MIN.) = 0.80 Tc(MIN.) = 14.47  
LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13904.00 = 2794.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13903.00 TO NODE 13904.00 IS CODE = 81  
-----

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

-----  
MAINLINE Tc(MIN.) = 14.47  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.980  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

USER-DEFINED - 21.29 0.30 0.996 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.996  
SUBAREA AREA(ACRES) = 21.29 SUBAREA RUNOFF(CFS) = 51.37  
EFFECTIVE AREA(ACRES) = 57.61 AREA-AVERAGED Fm(INCH/HR) = 0.30  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 57.6 PEAK FLOW RATE(CFS) = 139.07

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13904.00 TO NODE 13920.00 IS CODE = 31  
-----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 155.08 DOWNSTREAM(FEET) = 118.00  
FLOW LENGTH(FEET) = 1961.38 MANNING'S N = 0.013  
DEPTH OF FLOW IN 45.0 INCH PIPE IS 32.8 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 16.12  
ESTIMATED PIPE DIAMETER(INCH) = 45.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 139.07  
PIPE TRAVEL TIME(MIN.) = 2.03 Tc(MIN.) = 16.50  
LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13920.00 = 4755.38 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13904.00 TO NODE 13920.00 IS CODE = 81  
-----

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

-----  
MAINLINE Tc(MIN.) = 16.50  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.742  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 43.53 0.30 0.649 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.649  
SUBAREA AREA(ACRES) = 43.53 SUBAREA RUNOFF(CFS) = 99.78  
EFFECTIVE AREA(ACRES) = 101.14 AREA-AVERAGED Fm(INCH/HR) = 0.25  
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.84  
TOTAL AREA(ACRES) = 101.1 PEAK FLOW RATE(CFS) = 226.52

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13904.00 TO NODE 13920.00 IS CODE = 10  
-----

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

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13910.00 TO NODE 13910.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<

-----  
PEAK FLOWRATE TABLE FILE NAME: S38.DNA  
MEMORY BANK # 2 DEFINED AS FOLLOWS:  
STREAM Q Tc Fp(Fm) Ap Ae HEADWATER  
NUMBER (CFS) (MIN.) (INCH/HR) (ACRES) NODE  
1 28417.02 15.14 0.30( 0.29) 0.96 3660.5 13889.00  
2 34355.43 30.19 0.30( 0.29) 0.96 7401.2 13870.00

3	38596.35	41.95	0.30	( 0.29)	0.96	11251.8	20700.00
4	41345.80	50.03	0.30	( 0.29)	0.97	14749.8	10100.00
5	44982.29	60.49	0.30	( 0.29)	0.97	20398.2	20100.00
6	46516.09	68.20	0.30	( 0.29)	0.96	24727.3	31400.00
7	48175.91	77.69	0.30	( 0.29)	0.96	29933.3	13100.00
8	49664.23	84.08	0.30	( 0.29)	0.96	33038.0	11801.00
9	51746.42	93.21	0.30	( 0.29)	0.96	38079.8	11530.00
10	52842.65	98.51	0.30	( 0.29)	0.97	41728.4	13510.00
11	53845.29	103.54	0.30	( 0.29)	0.97	45079.6	13010.00
12	54866.89	108.36	0.30	( 0.29)	0.97	48328.1	11330.00
13	55417.86	114.60	0.30	( 0.29)	0.97	52758.5	11130.00
14	54720.05	122.25	0.30	( 0.29)	0.97	56748.7	12330.00
15	53987.39	128.98	0.30	( 0.29)	0.97	60091.8	12400.00
16	52882.11	137.77	0.30	( 0.29)	0.97	63459.1	12201.00
17	51311.39	147.31	0.30	( 0.29)	0.97	65914.8	12101.10
18	48727.17	159.68	0.30	( 0.29)	0.97	68077.6	12010.00
19	47168.94	165.81	0.30	( 0.29)	0.97	68394.2	10210.00
20	42638.57	192.58	0.30	( 0.29)	0.98	69126.2	10100.00

TOTAL AREA (ACRES) = 69126.2

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13910.00 TO NODE 13910.00 IS CODE = 14.0

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	28417.02	15.14	0.30 ( 0.29)	0.96	3660.5	13889.00
2	34355.43	30.19	0.30 ( 0.29)	0.96	7401.2	13870.00
3	38596.35	41.95	0.30 ( 0.29)	0.96	11251.8	20700.00
4	41345.80	50.03	0.30 ( 0.29)	0.97	14749.8	10100.00
5	44982.29	60.49	0.30 ( 0.29)	0.97	20398.2	20100.00
6	46516.09	68.20	0.30 ( 0.29)	0.96	24727.3	31400.00
7	48175.91	77.69	0.30 ( 0.29)	0.96	29933.3	13100.00
8	49664.23	84.08	0.30 ( 0.29)	0.96	33038.0	11801.00
9	51746.42	93.21	0.30 ( 0.29)	0.96	38079.8	11530.00
10	52842.65	98.51	0.30 ( 0.29)	0.97	41728.4	13510.00
11	53845.29	103.54	0.30 ( 0.29)	0.97	45079.6	13010.00
12	54866.89	108.36	0.30 ( 0.29)	0.97	48328.1	11330.00
13	55417.86	114.60	0.30 ( 0.29)	0.97	52758.5	11130.00
14	54720.05	122.25	0.30 ( 0.29)	0.97	56748.7	12330.00
15	53987.39	128.98	0.30 ( 0.29)	0.97	60091.8	12400.00
16	52882.11	137.77	0.30 ( 0.29)	0.97	63459.1	12201.00
17	51311.39	147.31	0.30 ( 0.29)	0.97	65914.8	12101.10
18	48727.17	159.68	0.30 ( 0.29)	0.97	68077.6	12010.00
19	47168.94	165.81	0.30 ( 0.29)	0.97	68394.2	10210.00
20	42638.57	192.58	0.30 ( 0.29)	0.98	69126.2	10100.00

TOTAL AREA (ACRES) = 69126.2

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13910.00 TO NODE 13920.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 119.70 DOWNSTREAM (FEET) = 118.00

CHANNEL LENGTH THRU SUBAREA (FEET) = 1376.26 CHANNEL SLOPE = 0.0012  
GIVEN CHANNEL BASE (FEET) = 100.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 24.88  
\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 0.947  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	96.09	0.30	0.535	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.535  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 55451.89  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.17  
AVERAGE FLOW DEPTH (FEET) = 24.87 TRAVEL TIME (MIN.) = 2.05  
Tc (MIN.) = 116.65  
SUBAREA AREA (ACRES) = 96.09 SUBAREA RUNOFF (CFS) = 68.06  
EFFECTIVE AREA (ACRES) = 52854.56 AREA-AVERAGED Fm (INCH/HR) = 0.29  
AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97  
TOTAL AREA (ACRES) = 69222.3 PEAK FLOW RATE (CFS) = 55417.86  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
GIVEN CHANNEL BASE (FEET) = 100.00 CHANNEL FREEBOARD (FEET) = 0.0  
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030  
\*ESTIMATED CHANNEL HEIGHT (FEET) = 24.87

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 24.87 FLOW VELOCITY (FEET/SEC.) = 11.17  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13920.00 = 136635.95 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13904.00 TO NODE 13920.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	28417.02	17.60	2.631	0.30 ( 0.28)	0.94	3756.6	13889.00
2	34355.43	32.53	1.791	0.30 ( 0.29)	0.95	7497.2	13870.00
3	38596.35	44.21	1.512	0.30 ( 0.29)	0.96	11347.9	20700.00
4	41345.80	52.25	1.363	0.30 ( 0.29)	0.96	14845.9	10100.00
5	44982.29	62.66	1.255	0.30 ( 0.29)	0.96	20494.3	20100.00
6	46516.09	70.35	1.203	0.30 ( 0.29)	0.96	24823.4	31400.00
7	48175.91	79.82	1.139	0.30 ( 0.29)	0.96	30029.4	13100.00
8	49664.23	86.20	1.096	0.30 ( 0.29)	0.96	33134.1	11801.00
9	51746.42	95.31	1.046	0.30 ( 0.29)	0.96	38175.9	11530.00
10	52842.65	100.59	1.021	0.30 ( 0.29)	0.96	41824.5	13510.00
11	53845.29	105.60	0.998	0.30 ( 0.29)	0.97	45175.7	13010.00
12	54866.89	110.41	0.976	0.30 ( 0.29)	0.97	48424.2	11330.00
13	55417.86	116.65	0.947	0.30 ( 0.29)	0.97	52854.6	11130.00
14	54720.05	124.31	0.921	0.30 ( 0.29)	0.97	56844.8	12330.00
15	53987.39	131.04	0.903	0.30 ( 0.29)	0.97	60187.9	12400.00
16	52882.11	139.85	0.881	0.30 ( 0.29)	0.97	63555.2	12201.00
17	51311.39	149.40	0.856	0.30 ( 0.29)	0.97	66010.8	12101.10
18	48727.17	161.81	0.824	0.30 ( 0.29)	0.97	68173.7	12010.00
19	47168.94	167.95	0.808	0.30 ( 0.29)	0.97	68490.3	10210.00
20	42638.57	194.79	0.760	0.30 ( 0.29)	0.97	69222.3	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13920.00 = 136635.95 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 226.52 16.50 2.742 0.30( 0.25) 0.84 101.1 13900.00
LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13920.00 = 4755.38 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 28109.75 16.50 2.742 0.30( 0.28) 0.94 3621.6 13900.00
2 28633.49 17.60 2.631 0.30( 0.28) 0.94 3857.8 13889.00
3 34495.46 32.53 1.791 0.30( 0.29) 0.95 7598.4 13870.00
4 38710.91 44.21 1.512 0.30( 0.29) 0.96 11449.0 20700.00
5 41446.82 52.25 1.363 0.30( 0.29) 0.96 14947.0 10100.00
6 45073.49 62.66 1.255 0.30( 0.29) 0.96 20595.5 20100.00
7 46602.55 70.35 1.203 0.30( 0.29) 0.96 24924.5 31400.00
8 48256.55 79.82 1.139 0.30( 0.29) 0.96 30130.6 13100.00
9 49740.93 86.20 1.096 0.30( 0.29) 0.96 33235.3 11801.00
10 51818.55 95.31 1.046 0.30( 0.29) 0.96 38277.1 11530.00
11 52912.58 100.59 1.021 0.30( 0.29) 0.96 41925.6 13510.00
12 53913.12 105.60 0.998 0.30( 0.29) 0.97 45276.8 13010.00
13 54932.71 110.41 0.976 0.30( 0.29) 0.97 48525.3 11330.00
14 55481.06 116.65 0.947 0.30( 0.29) 0.97 52955.7 11130.00
15 54780.84 124.31 0.921 0.30( 0.29) 0.97 56945.9 12330.00
16 54046.60 131.04 0.903 0.30( 0.29) 0.97 60289.0 12400.00
17 52939.23 139.85 0.881 0.30( 0.29) 0.97 63656.3 12201.00
18 51366.27 149.40 0.856 0.30( 0.29) 0.97 66112.0 12101.10
19 48779.14 161.81 0.824 0.30( 0.29) 0.97 68274.8 12010.00
20 47219.46 167.95 0.808 0.30( 0.29) 0.97 68591.4 10210.00
21 42684.72 194.79 0.760 0.30( 0.29) 0.97 69323.4 10100.00
TOTAL AREA (ACRES) = 69323.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 55481.06 Tc(MIN.) = 116.649
EFFECTIVE AREA(ACRES) = 52955.70 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 69323.4
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13920.00 = 136635.95 FEET.

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FLOW PROCESS FROM NODE 13920.00 TO NODE 13921.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 118.00 DOWNSTREAM(FEET) = 115.28
CHANNEL LENGTH THRU SUBAREA(FEET) = 335.44 CHANNEL SLOPE = 0.0081
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030
\*ESTIMATED CHANNEL HEIGHT(FEET) = 15.51
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 0.946

SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 134.30 0.30 0.658 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.658

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 55526.32
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 22.10
AVERAGE FLOW DEPTH(FEET) = 15.51 TRAVEL TIME(MIN.) = 0.25
Tc(MIN.) = 116.90
SUBAREA AREA(ACRES) = 134.30 SUBAREA RUNOFF(CFS) = 90.52
EFFECTIVE AREA(ACRES) = 53090.00 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 69457.7 PEAK FLOW RATE(CFS) = 55481.06
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030
\*ESTIMATED CHANNEL HEIGHT(FEET) = 15.50

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 15.50 FLOW VELOCITY(FEET/SEC.) = 22.10
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13921.00 = 136971.39 FEET.

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FLOW PROCESS FROM NODE 13921.00 TO NODE 14010.00 IS CODE = 56
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 115.28 DOWNSTREAM(FEET) = 100.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1396.08 CHANNEL SLOPE = 0.0109
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030
\*ESTIMATED CHANNEL HEIGHT(FEET) = 14.35
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 0.942

SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 96.27 0.30 0.723 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.723
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 55512.47
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 24.60
AVERAGE FLOW DEPTH(FEET) = 14.34 TRAVEL TIME(MIN.) = 0.95
Tc(MIN.) = 117.85

SUBAREA AREA(ACRES) = 96.27 SUBAREA RUNOFF(CFS) = 62.82
EFFECTIVE AREA(ACRES) = 53186.27 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 69554.0 PEAK FLOW RATE(CFS) = 55481.06
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
GIVEN CHANNEL BASE(FEET) = 100.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 4.000 MANNING'S FACTOR = 0.030
\*ESTIMATED CHANNEL HEIGHT(FEET) = 14.34

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 14.34 FLOW VELOCITY(FEET/SEC.) = 24.59
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 14010.00 = 138367.47 FEET.

\*\*\*\*\*
END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 69554.0 TC(MIN.) = 117.85
EFFECTIVE AREA(ACRES) = 53186.27 AREA-AVERAGED Fm(INCH/HR) = 0.29
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.969
PEAK FLOW RATE(CFS) = 55481.06

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	28109.75	17.96	2.596	0.30 ( 0.28)	0.93	3852.1	13900.00
2	28633.49	19.06	2.486	0.30 ( 0.28)	0.93	4088.3	13889.00
3	34495.46	33.91	1.756	0.30 ( 0.28)	0.94	7829.0	13870.00
4	38710.91	45.54	1.483	0.30 ( 0.29)	0.95	11679.6	20700.00
5	41446.82	53.56	1.348	0.30 ( 0.29)	0.96	15177.6	10100.00
6	45073.49	63.93	1.246	0.30 ( 0.29)	0.96	20826.0	20100.00
7	46602.55	71.61	1.194	0.30 ( 0.29)	0.96	25155.1	31400.00
8	48256.55	81.07	1.130	0.30 ( 0.29)	0.96	30361.1	13100.00
9	49740.93	87.44	1.087	0.30 ( 0.29)	0.96	33465.8	11801.00
10	51818.55	96.53	1.040	0.30 ( 0.29)	0.96	38507.6	11530.00
11	52912.58	101.80	1.016	0.30 ( 0.29)	0.96	42156.2	13510.00
12	53913.12	106.81	0.993	0.30 ( 0.29)	0.96	45507.4	13010.00
13	54932.71	111.62	0.971	0.30 ( 0.29)	0.97	48755.9	11330.00
14	55481.06	117.85	0.942	0.30 ( 0.29)	0.97	53186.3	11130.00
15	54780.84	125.51	0.918	0.30 ( 0.29)	0.97	57176.5	12330.00
16	54046.60	132.25	0.900	0.30 ( 0.29)	0.97	60519.6	12400.00
17	52939.23	141.07	0.878	0.30 ( 0.29)	0.97	63886.9	12201.00
18	51366.27	150.63	0.853	0.30 ( 0.29)	0.97	66342.6	12101.10
19	48779.14	163.05	0.821	0.30 ( 0.29)	0.97	68505.4	12010.00
20	47219.46	169.21	0.805	0.30 ( 0.29)	0.97	68822.0	10210.00
21	42684.72	196.08	0.759	0.30 ( 0.29)	0.97	69554.0	10100.00

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END OF RATIONAL METHOD ANALYSIS