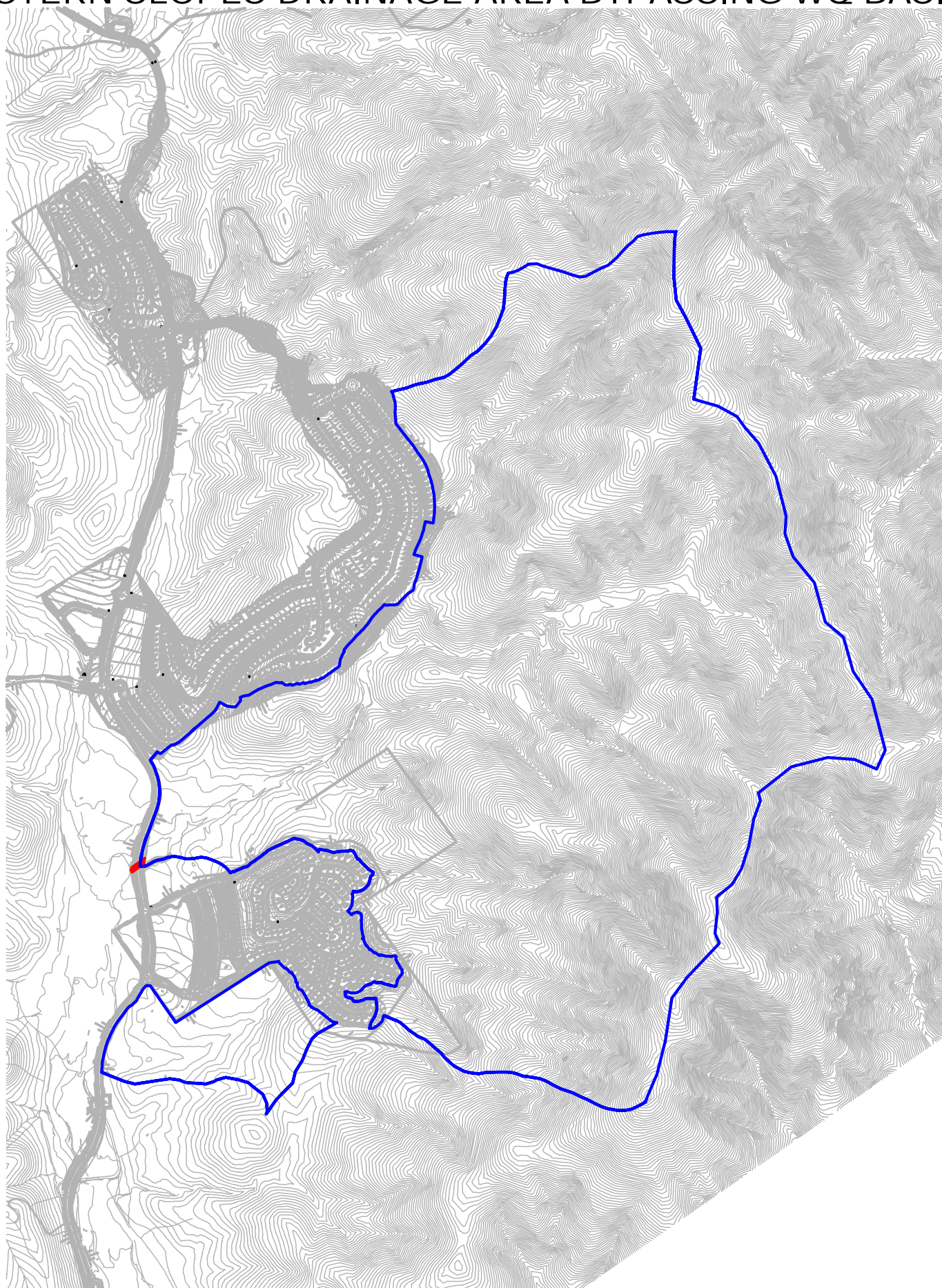


ORAY RANCH VILLAGE 14 & PA 16/19 EASTERN SLOPES DRAINAGE AREA BYPASSING WQ BASINS



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*****
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
          2003,1985,1981 HYDROLOGY MANUAL
(c) Copyright 1982-2015 Advanced Engineering Software (aes)
Ver. 22.0 Release Date: 07/01/2015 License ID 1239

Analysis prepared by:

HUnsaker & Associates San Diego, Inc.
9707 Waples Street
San Diego CA 92121

***** DESCRIPTION OF STUDY *****
* VILLAGE 14 OFFSITE FLOWS
*
*****
FILE NAME: R:\1235\HYD\CALCS\AES\SRP\V14OS.DAT
TIME/DATE OF STUDY: 10:47 10/17/2016

-----
USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
-----
2003 SAN DIEGO MANUAL CRITERIA

USER SPECIFIED STORM EVENT(YEAR) = 100.00
6-HOUR DURATION PRECIPITATION (INCHES) = 3.100
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
*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 16.0 8.0 0.020/0.020/0.020 0.50 2.00 0.0312 0.125 0.0150
2 12.0 6.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0130

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
1. Relative Flow-Depth = 0.00 FEET
   as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)
*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

*****
FLOW PROCESS FROM NODE 910.00 TO NODE 911.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
-----
*USER SPECIFIED(SUBAREA):
  URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) = 0
  INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
  UPSTREAM ELEVATION(FEET) = 1850.00
  DOWNSTREAM ELEVATION(FEET) = 1840.00
  ELEVATION DIFFERENCE(FEET) = 10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) = 6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.061
  SUBAREA RUNOFF(CFS) = 0.67
  TOTAL AREA(ACRES) = 0.27 TOTAL RUNOFF(CFS) = 0.67

*****
FLOW PROCESS FROM NODE 911.00 TO NODE 912.00 IS CODE = 53
-----
>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 1840.00 DOWNSTREAM(FEET) = 1350.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1029.00 CHANNEL SLOPE = 0.4762
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 0.67
FLOW VELOCITY(FEET/SEC) = 3.86 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 4.44 Tc(MIN.) = 10.70
LONGEST FLOWPATH FROM NODE 910.00 TO NODE 912.00 = 1129.00 FEET.

*****
FLOW PROCESS FROM NODE 911.00 TO NODE 912.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.999
*USER SPECIFIED(SUBAREA):
  URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) = 0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) = 21.52 SUBAREA RUNOFF(CFS) = 37.65
  TOTAL AREA(ACRES) = 21.8 TOTAL RUNOFF(CFS) = 38.12
  TC(MIN.) = 10.70

*****
FLOW PROCESS FROM NODE 912.00 TO NODE 913.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
-----
>>>>TRAVELTIME THRU SUBAREA<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 1350.00 DOWNSTREAM(FEET) = 960.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1665.00 CHANNEL SLOPE = 0.2342
NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 38.12
FLOW VELOCITY(FEET/SEC) = 11.33 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 2.45 Tc(MIN.) = 13.15
LONGEST FLOWPATH FROM NODE 910.00 TO NODE 913.00 = 2794.00 FEET.

*****
FLOW PROCESS FROM NODE 912.00 TO NODE 913.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.377
*USER SPECIFIED(SUBAREA):
  URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) = 0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) = 43.96 SUBAREA RUNOFF(CFS) = 67.34
  TOTAL AREA(ACRES) = 65.8 TOTAL RUNOFF(CFS) = 100.71
  TC(MIN.) = 13.15

*****
FLOW PROCESS FROM NODE 913.00 TO NODE 914.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 960.00 DOWNSTREAM(FEET) = 740.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 2094.00 CHANNEL SLOPE = 0.1051
NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 100.71
FLOW VELOCITY(FEET/SEC) = 15.04 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 2.32 Tc(MIN.) = 15.47
LONGEST FLOWPATH FROM NODE 910.00 TO NODE 914.00 = 4888.00 FEET.

*****
FLOW PROCESS FROM NODE 913.00 TO NODE 914.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.941
*USER SPECIFIED(SUBAREA):
  URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) = 0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) = 42.28 SUBAREA RUNOFF(CFS) = 58.32
  TOTAL AREA(ACRES) = 108.0 TOTAL RUNOFF(CFS) = 149.02
  TC(MIN.) = 15.47

*****
FLOW PROCESS FROM NODE 914.00 TO NODE 914.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
-----
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
  TIME OF CONCENTRATION(MIN.) = 15.47
  RAINFALL INTENSITY(INCH/HR) = 3.94
  TOTAL STREAM AREA(ACRES) = 108.03
  PEAK FLOW RATE(CFS) AT CONFLUENCE = 149.02

*****
FLOW PROCESS FROM NODE 914.10 TO NODE 914.20 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
-----
*USER SPECIFIED(SUBAREA):
  URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) = 0
  INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
  UPSTREAM ELEVATION(FEET) = 760.00
  DOWNSTREAM ELEVATION(FEET) = 750.00
  ELEVATION DIFFERENCE(FEET) = 10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) = 6.267
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.061
  SUBAREA RUNOFF(CFS) = 0.17
  TOTAL AREA(ACRES) = 0.07 TOTAL RUNOFF(CFS) = 0.17

*****
FLOW PROCESS FROM NODE 914.20 TO NODE 914.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 750.00 DOWNSTREAM(FEET) = 730.00
FLOW LENGTH(FEET) = 705.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 1.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 3.11
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 0.17
PIPE TRAVEL TIME(MIN.) = 3.77 Tc(MIN.) = 10.04
LONGEST FLOWPATH FROM NODE 914.10 TO NODE 914.00 = 805.00 FEET.

*****
FLOW PROCESS FROM NODE 914.20 TO NODE 914.00 IS CODE = 81
-----

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>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.209
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 1.76 SUBAREA RUNOFF(CFS) = 3.21
TOTAL AREA(ACRES) = 1.8 TOTAL RUNOFF(CFS) = 3.34
TC(MIN.) = 10.04

*****
FLOW PROCESS FROM NODE 914.00 TO NODE 914.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 10.04
RAINFALL INTENSITY(INCH/HR) = 5.21
TOTAL STREAM AREA(ACRES) = 1.83
PEAK FLOW RATE(CFS) AT CONFLUENCE = 3.34

** CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 149.02 15.47 3.941 108.03
2 3.34 10.04 5.209 1.83

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

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 100.03 10.04 5.209
2 151.54 15.47 3.941

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 151.54 Tc(MIN.) = 15.47
TOTAL AREA(ACRES) = 109.9
LONGEST FLOWPATH FROM NODE 910.00 TO NODE 914.00 = 4888.00 FEET.

*****
FLOW PROCESS FROM NODE 914.00 TO NODE 933.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 732.00 DOWNSTREAM(FEET) = 722.00
FLOW LENGTH(FEET) = 500.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 45.0 INCH PIPE IS 33.7 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 17.10
ESTIMATED PIPE DIAMETER(INCH) = 45.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 151.54
PIPE TRAVEL TIME(MIN.) = 0.49 Tc(MIN.) = 15.96
LONGEST FLOWPATH FROM NODE 910.00 TO NODE 933.00 = 5388.00 FEET.

*****
FLOW PROCESS FROM NODE 933.00 TO NODE 933.00 IS CODE = 10
-----
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
=====
*****
FLOW PROCESS FROM NODE 916.00 TO NODE 917.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 1775.00
DOWNSTREAM ELEVATION(FEET) = 1765.00
ELEVATION DIFFERENCE(FEET) = 10.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 6.267
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.061
SUBAREA RUNOFF(CFS) = 0.67
TOTAL AREA(ACRES) = 0.27 TOTAL RUNOFF(CFS) = 0.67

*****
FLOW PROCESS FROM NODE 917.00 TO NODE 918.00 IS CODE = 53
-----
>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1765.00 DOWNSTREAM(FEET) = 1240.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 2022.00 CHANNEL SLOPE = 0.2596
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 0.67
FLOW VELOCITY(FEET/SEC) = 2.85 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 11.81 Tc(MIN.) = 18.08
LONGEST FLOWPATH FROM NODE 916.00 TO NODE 918.00 = 2122.00 FEET.

*****
FLOW PROCESS FROM NODE 917.00 TO NODE 918.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.565
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 11.69 SUBAREA RUNOFF(CFS) = 14.59
TOTAL AREA(ACRES) = 12.0 TOTAL RUNOFF(CFS) = 14.92
TC(MIN.) = 18.08

*****
FLOW PROCESS FROM NODE 918.00 TO NODE 919.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1240.00 DOWNSTREAM(FEET) = 985.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1112.00 CHANNEL SLOPE = 0.2293
NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 14.92
FLOW VELOCITY(FEET/SEC) = 8.76 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 2.11 Tc(MIN.) = 20.19
LONGEST FLOWPATH FROM NODE 916.00 TO NODE 919.00 = 3234.00 FEET.

*****
FLOW PROCESS FROM NODE 918.00 TO NODE 919.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.320
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 19.69 SUBAREA RUNOFF(CFS) = 22.88
TOTAL AREA(ACRES) = 31.7 TOTAL RUNOFF(CFS) = 36.77
TC(MIN.) = 20.19

*****
FLOW PROCESS FROM NODE 919.00 TO NODE 920.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 985.00 DOWNSTREAM(FEET) = 755.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1299.00 CHANNEL SLOPE = 0.1771
NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 36.77
FLOW VELOCITY(FEET/SEC) = 11.21 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 1.93 Tc(MIN.) = 22.12
LONGEST FLOWPATH FROM NODE 916.00 TO NODE 920.00 = 4533.00 FEET.

*****
FLOW PROCESS FROM NODE 919.00 TO NODE 920.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.130
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 37.07 SUBAREA RUNOFF(CFS) = 40.61
TOTAL AREA(ACRES) = 68.7 TOTAL RUNOFF(CFS) = 75.28
TC(MIN.) = 22.12

*****
FLOW PROCESS FROM NODE 920.00 TO NODE 927.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 750.00 DOWNSTREAM(FEET) = 745.00
FLOW LENGTH(FEET) = 167.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 33.0 INCH PIPE IS 23.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 16.84
ESTIMATED PIPE DIAMETER(INCH) = 33.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 75.28
PIPE TRAVEL TIME(MIN.) = 0.17 Tc(MIN.) = 22.29
LONGEST FLOWPATH FROM NODE 916.00 TO NODE 927.00 = 4700.00 FEET.

*****
FLOW PROCESS FROM NODE 927.00 TO NODE 927.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 22.29
RAINFALL INTENSITY(INCH/HR) = 3.11
TOTAL STREAM AREA(ACRES) = 68.72
PEAK FLOW RATE(CFS) AT CONFLUENCE = 75.28

*****
FLOW PROCESS FROM NODE 922.00 TO NODE 923.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====

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*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 1750.00
DOWNSTREAM ELEVATION(FEET) = 1740.00
ELEVATION DIFFERENCE(FEET) = 10.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 6.267
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.061
SUBAREA RUNOFF(CFS) = 0.59
TOTAL AREA(ACRES) = 0.24 TOTAL RUNOFF(CFS) = 0.59

*****
FLOW PROCESS FROM NODE 923.00 TO NODE 924.00 IS CODE = 53
-----
>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1740.00 DOWNSTREAM(FEET) = 1330.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1080.00 CHANNEL SLOPE = 0.3796
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 0.59
FLOW VELOCITY(FEET/SEC) = 3.45 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 5.22 Tc(MIN.) = 11.48
LONGEST FLOWPATH FROM NODE 922.00 TO NODE 924.00 = 1180.00 FEET.

*****
FLOW PROCESS FROM NODE 923.00 TO NODE 924.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.777
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 12.01 SUBAREA RUNOFF(CFS) = 20.08
TOTAL AREA(ACRES) = 12.2 TOTAL RUNOFF(CFS) = 20.48
TC(MIN.) = 11.48

*****
FLOW PROCESS FROM NODE 924.00 TO NODE 925.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1330.00 DOWNSTREAM(FEET) = 1080.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 982.00 CHANNEL SLOPE = 0.2546
NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 20.48
FLOW VELOCITY(FEET/SEC) = 9.54 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 1.72 Tc(MIN.) = 13.20
LONGEST FLOWPATH FROM NODE 922.00 TO NODE 925.00 = 2162.00 FEET.

*****
FLOW PROCESS FROM NODE 924.00 TO NODE 925.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.367
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 26.68 SUBAREA RUNOFF(CFS) = 40.78
TOTAL AREA(ACRES) = 38.9 TOTAL RUNOFF(CFS) = 59.50
TC(MIN.) = 13.20

*****
FLOW PROCESS FROM NODE 925.00 TO NODE 926.00 IS CODE = 53
-----
>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1080.00 DOWNSTREAM(FEET) = 750.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1683.00 CHANNEL SLOPE = 0.1961
CHANNEL FLOW THRU SUBAREA(CFS) = 59.50
FLOW VELOCITY(FEET/SEC) = 9.67 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 2.90 Tc(MIN.) = 16.10
LONGEST FLOWPATH FROM NODE 922.00 TO NODE 926.00 = 3845.00 FEET.

*****
FLOW PROCESS FROM NODE 925.00 TO NODE 926.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.842
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 33.93 SUBAREA RUNOFF(CFS) = 45.62
TOTAL AREA(ACRES) = 72.9 TOTAL RUNOFF(CFS) = 97.97
TC(MIN.) = 16.10

*****
FLOW PROCESS FROM NODE 926.00 TO NODE 927.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 750.00 DOWNSTREAM(FEET) = 745.00
FLOW LENGTH(FEET) = 167.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 36.0 INCH PIPE IS 26.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 17.93
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 97.97
PIPE TRAVEL TIME(MIN.) = 0.16 Tc(MIN.) = 16.26
LONGEST FLOWPATH FROM NODE 922.00 TO NODE 927.00 = 4012.00 FEET.

*****
FLOW PROCESS FROM NODE 927.00 TO NODE 927.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 16.26
RAINFALL INTENSITY(INCH/HR) = 3.82
TOTAL STREAM AREA(ACRES) = 72.86
PEAK FLOW RATE(CFS) AT CONFLUENCE = 97.97

** CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 75.28 22.29 3.115 68.72
2 97.97 16.26 3.818 72.86

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

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 152.87 16.26 3.818
2 155.20 22.29 3.115

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 155.20 Tc(MIN.) = 22.29
TOTAL AREA(ACRES) = 141.6
LONGEST FLOWPATH FROM NODE 916.00 TO NODE 927.00 = 4700.00 FEET.

*****
FLOW PROCESS FROM NODE 927.00 TO NODE 928.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 745.00 DOWNSTREAM(FEET) = 737.00
FLOW LENGTH(FEET) = 321.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 45.0 INCH PIPE IS 31.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 18.85
ESTIMATED PIPE DIAMETER(INCH) = 45.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 155.20
PIPE TRAVEL TIME(MIN.) = 0.28 Tc(MIN.) = 22.57
LONGEST FLOWPATH FROM NODE 916.00 TO NODE 928.00 = 5021.00 FEET.

*****
FLOW PROCESS FROM NODE 928.00 TO NODE 928.00 IS CODE = 10
-----
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<
=====
*****
FLOW PROCESS FROM NODE 932.10 TO NODE 932.20 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 780.00
DOWNSTREAM ELEVATION(FEET) = 770.00
ELEVATION DIFFERENCE(FEET) = 10.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 6.267
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.061
SUBAREA RUNOFF(CFS) = 0.40
TOTAL AREA(ACRES) = 0.16 TOTAL RUNOFF(CFS) = 0.40

*****
FLOW PROCESS FROM NODE 932.20 TO NODE 932.30 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 770.00 DOWNSTREAM(FEET) = 750.00
FLOW LENGTH(FEET) = 302.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 1.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.44
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 0.40
PIPE TRAVEL TIME(MIN.) = 0.93 Tc(MIN.) = 7.19
LONGEST FLOWPATH FROM NODE 932.10 TO NODE 932.30 = 402.00 FEET.

*****
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<

```

```

FLOW PROCESS FROM NODE      932.20 TO NODE      932.30 IS CODE = 81
-----
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.460
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 0.59 SUBAREA RUNOFF(CFS) = 1.33
TOTAL AREA(ACRES) = 0.8 TOTAL RUNOFF(CFS) = 1.70
TC(MIN.) = 7.19
*****
FLOW PROCESS FROM NODE      932.30 TO NODE      932.50 IS CODE = 31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 750.00 DOWNSTREAM(FEET) = 740.00
FLOW LENGTH(FEET) = 337.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 3.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.31
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 1.70
PIPE TRAVEL TIME(MIN.) = 0.89 Tc(MIN.) = 8.08
LONGEST FLOWPATH FROM NODE      932.10 TO NODE      932.50 = 739.00 FEET.
*****
FLOW PROCESS FROM NODE      932.50 TO NODE      932.50 IS CODE = 1
-----
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 8.08
RAINFALL INTENSITY(INCH/HR) = 5.99
TOTAL STREAM AREA(ACRES) = 0.75
PEAK FLOW RATE(CFS) AT CONFLUENCE = 1.70
*****
FLOW PROCESS FROM NODE      930.00 TO NODE      931.00 IS CODE = 21
-----
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=====
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 845.00
DOWNSTREAM ELEVATION(FEET) = 835.00
ELEVATION DIFFERENCE(FEET) = 10.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 6.267
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.061
SUBAREA RUNOFF(CFS) = 0.59
TOTAL AREA(ACRES) = 0.24 TOTAL RUNOFF(CFS) = 0.59
*****
FLOW PROCESS FROM NODE      931.00 TO NODE      932.00 IS CODE = 53
-----
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 835.00 DOWNSTREAM(FEET) = 750.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 382.00 CHANNEL SLOPE = 0.2225
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 0.59
FLOW VELOCITY(FEET/SEC) = 2.64 (PER LACPCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 2.41 Tc(MIN.) = 8.68
LONGEST FLOWPATH FROM NODE      930.00 TO NODE      932.00 = 482.00 FEET.
*****
FLOW PROCESS FROM NODE      931.00 TO NODE      932.00 IS CODE = 81
-----
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.724
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 2.36 SUBAREA RUNOFF(CFS) = 4.73
TOTAL AREA(ACRES) = 2.6 TOTAL RUNOFF(CFS) = 5.21
TC(MIN.) = 8.68
*****
FLOW PROCESS FROM NODE      932.00 TO NODE      932.50 IS CODE = 31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 745.00 DOWNSTREAM(FEET) = 740.00
FLOW LENGTH(FEET) = 140.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 7.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 9.98
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 6.79
PIPE TRAVEL TIME(MIN.) = 0.23 Tc(MIN.) = 9.28
LONGEST FLOWPATH FROM NODE      932.10 TO NODE      928.00 = 879.00 FEET.
*****
FLOW PROCESS FROM NODE      928.00 TO NODE      928.00 IS CODE = 11
-----
>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
=====
** MAIN STREAM CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 6.79 9.28 5.483 3.35
LONGEST FLOWPATH FROM NODE      932.10 TO NODE      928.00 = 879.00 FEET.
** MEMORY BANK # 3 CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 155.20 22.57 3.090 141.58
LONGEST FLOWPATH FROM NODE      916.00 TO NODE      928.00 = 5021.00 FEET.
** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 70.56 9.28 5.483
2 159.03 22.57 3.090
COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 159.03 Tc(MIN.) = 22.57
TOTAL AREA(ACRES) = 144.9
*****
FLOW PROCESS FROM NODE      928.00 TO NODE      928.00 IS CODE = 12
-----
>>>>>CLEAR MEMORY BANK # 3 <<<<<
=====
*****
FLOW PROCESS FROM NODE      928.00 TO NODE      933.00 IS CODE = 31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 737.00 DOWNSTREAM(FEET) = 722.00
FLOW LENGTH(FEET) = 283.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 39.0 INCH PIPE IS 27.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 25.11
ESTIMATED PIPE DIAMETER(INCH) = 39.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 159.03
PIPE TRAVEL TIME(MIN.) = 0.19 Tc(MIN.) = 22.76
LONGEST FLOWPATH FROM NODE      916.00 TO NODE      933.00 = 5304.00 FEET.

```

```

*****
FLOW PROCESS FROM NODE      933.00 TO NODE      933.00 IS CODE = 11
-----
>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<
=====
** MAIN STREAM CONFLUENCE DATA **
STREAM      RUNOFF      Tc      INTENSITY      AREA
NUMBER      (CFS)      (MIN.)      (INCH/HOUR)      (ACRE)
1      159.03      22.76      3.073      144.93
LONGEST FLOWPATH FROM NODE      916.00 TO NODE      933.00 =      5304.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **
STREAM      RUNOFF      Tc      INTENSITY      AREA
NUMBER      (CFS)      (MIN.)      (INCH/HOUR)      (ACRE)
1      151.54      15.96      3.863      109.86
LONGEST FLOWPATH FROM NODE      910.00 TO NODE      933.00 =      5388.00 FEET.

** PEAK FLOW RATE TABLE **
STREAM      RUNOFF      Tc      INTENSITY
NUMBER      (CFS)      (MIN.)      (INCH/HOUR)
1      263.08      15.96      3.863
2      279.57      22.76      3.073

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =      279.57      Tc(MIN.) =      22.76
TOTAL AREA(ACRES) =      254.8

*****
FLOW PROCESS FROM NODE      933.00 TO NODE      933.00 IS CODE = 12
-----
>>>>CLEAR MEMORY BANK # 1 <<<<
=====
*****
FLOW PROCESS FROM NODE      933.00 TO NODE      934.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =      722.00 DOWNSTREAM(FEET) =      660.00
FLOW LENGTH(FEET) =      1279.00 MANNING'S N =      0.013
DEPTH OF FLOW IN 48.0 INCH PIPE IS 35.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =      27.79
ESTIMATED PIPE DIAMETER(INCH) =      48.00 NUMBER OF PIPES =      1
PIPE-FLOW(CFS) =      279.57
PIPE TRAVEL TIME(MIN.) =      0.77      Tc(MIN.) =      23.53
LONGEST FLOWPATH FROM NODE      910.00 TO NODE      934.00 =      6667.00 FEET.

*****
FLOW PROCESS FROM NODE      934.00 TO NODE      935.00 IS CODE = 53
-----
>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =      3660.00 DOWNSTREAM(FEET) =      615.00
CHANNEL LENGTH THRU SUBAREA(FEET) =      1100.00 CHANNEL SLOPE =      2.7682
NOTE: CHANNEL SLOPE OF .5 WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) =      279.57
FLOW VELOCITY(FEET/SEC) =      25.84 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =      0.71      Tc(MIN.) =      24.24
LONGEST FLOWPATH FROM NODE      910.00 TO NODE      935.00 =      7767.00 FEET.

*****
FLOW PROCESS FROM NODE      934.00 TO NODE      935.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =      2.951
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) =      0
AREA-AVERAGE RUNOFF COEFFICIENT =      0.3500
SUBAREA AREA(ACRES) =      24.30 SUBAREA RUNOFF(CFS) =      25.10
TOTAL AREA(ACRES) =      279.1 TOTAL RUNOFF(CFS) =      288.25
TC(MIN.) =      24.24

*****
FLOW PROCESS FROM NODE      935.00 TO NODE      936.00 IS CODE = 53
-----
>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =      615.00 DOWNSTREAM(FEET) =      580.00
CHANNEL LENGTH THRU SUBAREA(FEET) =      1376.00 CHANNEL SLOPE =      0.0254
CHANNEL FLOW THRU SUBAREA(CFS) =      288.25
FLOW VELOCITY(FEET/SEC) =      5.89 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =      3.89      Tc(MIN.) =      28.13
LONGEST FLOWPATH FROM NODE      910.00 TO NODE      936.00 =      9143.00 FEET.

*****
FLOW PROCESS FROM NODE      935.00 TO NODE      936.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =      2.681
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) =      0
AREA-AVERAGE RUNOFF COEFFICIENT =      0.3500
SUBAREA AREA(ACRES) =      2.03 SUBAREA RUNOFF(CFS) =      3.18
TOTAL AREA(ACRES) =      2.2 TOTAL RUNOFF(CFS) =      3.42
TC(MIN.) =      12.69

*****
FLOW PROCESS FROM NODE      936.00 TO NODE      937.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =      580.00 DOWNSTREAM(FEET) =      577.00
FLOW LENGTH(FEET) =      65.00 MANNING'S N =      0.013
DEPTH OF FLOW IN 48.0 INCH PIPE IS 38.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =      27.28
ESTIMATED PIPE DIAMETER(INCH) =      48.00 NUMBER OF PIPES =      1
PIPE-FLOW(CFS) =      292.80
PIPE TRAVEL TIME(MIN.) =      0.04      Tc(MIN.) =      28.17
LONGEST FLOWPATH FROM NODE      910.00 TO NODE      937.00 =      9208.00 FEET.

*****
FLOW PROCESS FROM NODE      937.00 TO NODE      937.00 IS CODE = 10
-----
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
=====
*****
FLOW PROCESS FROM NODE      944.00 TO NODE      943.00 IS CODE = 7
-----
>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<
=====
USER-SPECIFIED VALUES ARE AS FOLLOWS:
TC(MIN) =      14.16 RAIN INTENSITY(INCH/HOUR) =      4.17
TOTAL AREA(ACRES) =      161.30 TOTAL RUNOFF(CFS) =      337.35

*****
FLOW PROCESS FROM NODE      943.00 TO NODE      943.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
=====
TOTAL NUMBER OF STREAMS =      2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) =      14.16
RAINFALL INTENSITY(INCH/HR) =      4.17
TOTAL STREAM AREA(ACRES) =      161.30
PEAK FLOW RATE(CFS) AT CONFLUENCE =      337.35

*****
FLOW PROCESS FROM NODE      940.00 TO NODE      941.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) =      0
INITIAL SUBAREA FLOW-LENGTH(FEET) =      100.00
UPSTREAM ELEVATION(FEET) =      630.00
DOWNSTREAM ELEVATION(FEET) =      625.00
ELEVATION DIFFERENCE(FEET) =      5.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) =      7.695
WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
THE MAXIMUM OVERLAND FLOW LENGTH =      95.00
(Reference: Table 3-1B of Hydrology Manual)
THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =      6.185
SUBAREA RUNOFF(CFS) =      0.32
TOTAL AREA(ACRES) =      0.15 TOTAL RUNOFF(CFS) =      0.32

*****
FLOW PROCESS FROM NODE      941.00 TO NODE      942.00 IS CODE = 53
-----
>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =      625.00 DOWNSTREAM(FEET) =      600.00
CHANNEL LENGTH THRU SUBAREA(FEET) =      413.00 CHANNEL SLOPE =      0.0605
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) =      0.32
FLOW VELOCITY(FEET/SEC) =      1.38 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =      5.00      Tc(MIN.) =      12.69
LONGEST FLOWPATH FROM NODE      940.00 TO NODE      942.00 =      513.00 FEET.

*****
FLOW PROCESS FROM NODE      941.00 TO NODE      942.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =      4.479
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) =      0
AREA-AVERAGE RUNOFF COEFFICIENT =      0.3500
SUBAREA AREA(ACRES) =      2.03 SUBAREA RUNOFF(CFS) =      3.18
TOTAL AREA(ACRES) =      2.2 TOTAL RUNOFF(CFS) =      3.42
TC(MIN.) =      12.69

*****
FLOW PROCESS FROM NODE      942.00 TO NODE      943.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<

```

```

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 600.00 DOWNSTREAM(FEET) = 595.00
FLOW LENGTH(FEET) = 82.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 4.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 9.98
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 3.42
PIPE TRAVEL TIME(MIN.) = 0.14 Tc(MIN.) = 12.83
LONGEST FLOWPATH FROM NODE 940.00 TO NODE 943.00 = 595.00 FEET.
+-----+
| END OF FIRST OFFSITE BOUNDARY |
+-----+
FLOW PROCESS FROM NODE 943.00 TO NODE 943.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 12.83
RAINFALL INTENSITY(INCH/HR) = 4.45
TOTAL STREAM AREA(ACRES) = 2.18
PEAK FLOW RATE(CFS) AT CONFLUENCE = 3.42

** CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 337.35 14.16 4.173 161.30
2 3.42 12.83 4.448 2.18

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

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 309.04 12.83 4.448
2 340.56 14.16 4.173

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 340.56 Tc(MIN.) = 14.16
TOTAL AREA(ACRES) = 163.5
LONGEST FLOWPATH FROM NODE 910.00 TO NODE 943.00 = 9208.00 FEET.
*****
FLOW PROCESS FROM NODE 943.00 TO NODE 937.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 595.00 DOWNSTREAM(FEET) = 582.00
FLOW LENGTH(FEET) = 1000.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 66.0 INCH PIPE IS 49.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 17.81
ESTIMATED PIPE DIAMETER(INCH) = 66.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 340.56
PIPE TRAVEL TIME(MIN.) = 0.94 Tc(MIN.) = 15.10
LONGEST FLOWPATH FROM NODE 910.00 TO NODE 937.00 = 10208.00 FEET.
*****
FLOW PROCESS FROM NODE 937.00 TO NODE 937.00 IS CODE = 11
-----
>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<
=====
** MAIN STREAM CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 340.56 15.10 4.005 163.48
LONGEST FLOWPATH FROM NODE 910.00 TO NODE 937.00 = 10208.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 292.80 28.17 2.678 312.09
LONGEST FLOWPATH FROM NODE 910.00 TO NODE 937.00 = 9208.00 FEET.

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 497.46 15.10 4.005
2 520.54 28.17 2.678

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 520.54 Tc(MIN.) = 28.17
TOTAL AREA(ACRES) = 475.6
*****
FLOW PROCESS FROM NODE 937.00 TO NODE 937.00 IS CODE = 12
-----
>>>>CLEAR MEMORY BANK # 1 <<<<
=====
*****
FLOW PROCESS FROM NODE 937.00 TO NODE 945.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 578.00 DOWNSTREAM(FEET) = 577.00
FLOW LENGTH(FEET) = 65.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 75.0 INCH PIPE IS 56.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 21.09
ESTIMATED PIPE DIAMETER(INCH) = 75.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 520.54
PIPE TRAVEL TIME(MIN.) = 0.05 Tc(MIN.) = 28.22
LONGEST FLOWPATH FROM NODE 910.00 TO NODE 945.00 = 10273.00 FEET.
+-----+
| END OF FIRST OFFSITE BOUNDARY |
+-----+
FLOW PROCESS FROM NODE 950.00 TO NODE 951.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 1860.00
DOWNSTREAM ELEVATION(FEET) = 1850.00
ELEVATION DIFFERENCE(FEET) = 10.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 6.267
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.061
SUBAREA RUNOFF(CFS) = 0.84
TOTAL AREA(ACRES) = 0.34 TOTAL RUNOFF(CFS) = 0.84
*****
FLOW PROCESS FROM NODE 951.00 TO NODE 952.00 IS CODE = 53
-----
>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1850.00 DOWNSTREAM(FEET) = 1390.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1137.00 CHANNEL SLOPE = 0.4046
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 0.84
FLOW VELOCITY(FEET/SEC) = 3.56 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 5.32 Tc(MIN.) = 11.59
LONGEST FLOWPATH FROM NODE 950.00 TO NODE 952.00 = 1237.00 FEET.
*****
FLOW PROCESS FROM NODE 951.00 TO NODE 952.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.750
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 18.34 SUBAREA RUNOFF(CFS) = 30.49
TOTAL AREA(ACRES) = 18.7 TOTAL RUNOFF(CFS) = 31.05
Tc(MIN.) = 11.59
*****
FLOW PROCESS FROM NODE 952.00 TO NODE 953.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1390.00 DOWNSTREAM(FEET) = 1040.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1715.00 CHANNEL SLOPE = 0.2041
NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 31.05
FLOW VELOCITY(FEET/SEC) = 10.69 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 2.67 Tc(MIN.) = 14.26
LONGEST FLOWPATH FROM NODE 950.00 TO NODE 953.00 = 2952.00 FEET.
*****
FLOW PROCESS FROM NODE 952.00 TO NODE 953.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.155
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 96.51 SUBAREA RUNOFF(CFS) = 140.34
TOTAL AREA(ACRES) = 115.2 TOTAL RUNOFF(CFS) = 167.50
Tc(MIN.) = 14.26
*****
FLOW PROCESS FROM NODE 953.00 TO NODE 954.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1040.00 DOWNSTREAM(FEET) = 880.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 2170.00 CHANNEL SLOPE = 0.0737
CHANNEL FLOW THRU SUBAREA(CFS) = 167.50
FLOW VELOCITY(FEET/SEC) = 15.08 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 2.40 Tc(MIN.) = 16.66

```

```

LONGEST FLOWPATH FROM NODE 950.00 TO NODE 954.00 = 5122.00 FEET. -----
*****
FLOW PROCESS FROM NODE 953.00 TO NODE 954.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.758
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 73.58 SUBAREA RUNOFF(CFS) = 96.78
TOTAL AREA(ACRES) = 188.8 TOTAL RUNOFF(CFS) = 248.30
TC(MIN.) = 16.66

***** ** MAIN STREAM CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 19.76 11.65 4.734 10.68
LONGEST FLOWPATH FROM NODE 957.00 TO NODE 955.00 = 2445.00 FEET.

***** ** MEMORY BANK # 1 CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 248.30 16.79 3.739 188.77
LONGEST FLOWPATH FROM NODE 950.00 TO NODE 955.00 = 5235.00 FEET.

***** ** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 191.97 11.65 4.734
2 263.91 16.79 3.739

***** COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 263.91 Tc(MIN.) = 16.79
TOTAL AREA(ACRES) = 199.5

*****
FLOW PROCESS FROM NODE 954.00 TO NODE 955.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 874.00 DOWNSTREAM(FEET) = 873.00
FLOW LENGTH(FEET) = 113.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 63.0 INCH PIPE IS 47.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 14.24
ESTIMATED PIPE DIAMETER(INCH) = 63.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 248.30
PIPE TRAVEL TIME(MIN.) = 0.13 Tc(MIN.) = 16.79
LONGEST FLOWPATH FROM NODE 950.00 TO NODE 955.00 = 5235.00 FEET.

*****
FLOW PROCESS FROM NODE 955.00 TO NODE 955.00 IS CODE = 10
-----
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
=====
FLOW PROCESS FROM NODE 957.00 TO NODE 958.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 1240.00
DOWNSTREAM ELEVATION(FEET) = 1230.00
ELEVATION DIFFERENCE(FEET) = 10.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 6.267
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.061
SUBAREA RUNOFF(CFS) = 0.62
TOTAL AREA(ACRES) = 0.25 TOTAL RUNOFF(CFS) = 0.62

*****
FLOW PROCESS FROM NODE 958.00 TO NODE 958.00 IS CODE = 53
-----
>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1230.00 DOWNSTREAM(FEET) = 980.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 708.00 CHANNEL SLOPE = 0.3531
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 0.62
FLOW VELOCITY(FEET/SEC) = 3.33 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 3.55 Tc(MIN.) = 9.81
LONGEST FLOWPATH FROM NODE 957.00 TO NODE 958.00 = 808.00 FEET.

*****
FLOW PROCESS FROM NODE 958.00 TO NODE 959.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.287
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 10.43 SUBAREA RUNOFF(CFS) = 19.30
TOTAL AREA(ACRES) = 10.7 TOTAL RUNOFF(CFS) = 19.76
TC(MIN.) = 9.81

*****
FLOW PROCESS FROM NODE 959.00 TO NODE 955.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 994.00 DOWNSTREAM(FEET) = 908.00
FLOW LENGTH(FEET) = 1637.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.7 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 14.89
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 19.76
PIPE TRAVEL TIME(MIN.) = 1.83 Tc(MIN.) = 11.65
LONGEST FLOWPATH FROM NODE 957.00 TO NODE 955.00 = 2445.00 FEET.

*****
FLOW PROCESS FROM NODE 955.00 TO NODE 955.00 IS CODE = 11
-----
>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<
=====
** MAIN STREAM CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 19.76 11.65 4.734 10.68
LONGEST FLOWPATH FROM NODE 957.00 TO NODE 955.00 = 2445.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 248.30 16.79 3.739 188.77
LONGEST FLOWPATH FROM NODE 950.00 TO NODE 955.00 = 5235.00 FEET.

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 191.97 11.65 4.734
2 263.91 16.79 3.739

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 263.91 Tc(MIN.) = 16.79
TOTAL AREA(ACRES) = 199.5

*****
FLOW PROCESS FROM NODE 955.00 TO NODE 955.00 IS CODE = 12
-----
>>>>CLEAR MEMORY BANK # 1 <<<<
=====
*****
FLOW PROCESS FROM NODE 955.00 TO NODE 960.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 908.00 DOWNSTREAM(FEET) = 905.00
FLOW LENGTH(FEET) = 204.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 57.0 INCH PIPE IS 45.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 17.27
ESTIMATED PIPE DIAMETER(INCH) = 57.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 263.91
PIPE TRAVEL TIME(MIN.) = 0.20 Tc(MIN.) = 16.99
LONGEST FLOWPATH FROM NODE 950.00 TO NODE 960.00 = 5439.00 FEET.

*****
FLOW PROCESS FROM NODE 960.00 TO NODE 960.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 16.99
RAINFALL INTENSITY(INCH/HR) = 3.71
TOTAL STREAM AREA(ACRES) = 199.45
PEAK FLOW RATE(CFS) AT CONFLUENCE = 263.91

*****
FLOW PROCESS FROM NODE 962.00 TO NODE 963.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 1240.00
DOWNSTREAM ELEVATION(FEET) = 1230.00
ELEVATION DIFFERENCE(FEET) = 10.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 6.267
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.061
SUBAREA RUNOFF(CFS) = 0.69
TOTAL AREA(ACRES) = 0.28 TOTAL RUNOFF(CFS) = 0.69

*****
FLOW PROCESS FROM NODE 963.00 TO NODE 964.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1230.00 DOWNSTREAM(FEET) = 890.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1033.00 CHANNEL SLOPE = 0.3291
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 0.69
FLOW VELOCITY(FEET/SEC) = 4.74 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 3.63 Tc(MIN.) = 9.90
LONGEST FLOWPATH FROM NODE 962.00 TO NODE 964.00 = 1133.00 FEET.

*****
FLOW PROCESS FROM NODE 963.00 TO NODE 964.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.258
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500

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S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 9.84 SUBAREA RUNOFF(CFS) = 18.11
TOTAL AREA(ACRES) = 10.1 TOTAL RUNOFF(CFS) = 18.63
TC(MIN.) = 9.90
-----
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
=====
*****
FLOW PROCESS FROM NODE 967.00 TO NODE 968.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 1670.00
DOWNSTREAM ELEVATION(FEET) = 1660.00
ELEVATION DIFFERENCE(FEET) = 10.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 6.267
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.061
SUBAREA RUNOFF(CFS) = 1.75
TOTAL AREA(ACRES) = 0.71 TOTAL RUNOFF(CFS) = 1.75
=====
FLOW PROCESS FROM NODE 960.00 TO NODE 960.00 IS CODE = 1
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 900.00 DOWNSTREAM(FEET) = 895.00
FLOW LENGTH(FEET) = 215.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 21.0 INCH PIPE IS 14.1 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 10.85
ESTIMATED PIPE DIAMETER(INCH) = 21.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 18.63
PIPE TRAVEL TIME(MIN.) = 0.33 Tc(MIN.) = 10.23
LONGEST FLOWPATH FROM NODE 962.00 TO NODE 960.00 = 1348.00 FEET.
=====
*****
FLOW PROCESS FROM NODE 960.00 TO NODE 960.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 10.23
RAINFALL INTENSITY(INCH/HR) = 5.15
TOTAL STREAM AREA(ACRES) = 10.12
PEAK FLOW RATE(CFS) AT CONFLUENCE = 18.63

** CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 263.91 16.99 3.711 199.45
2 18.63 10.23 5.148 10.12

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

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 177.49 10.23 5.148
2 277.33 16.99 3.711

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 277.33 Tc(MIN.) = 16.99
TOTAL AREA(ACRES) = 209.6
LONGEST FLOWPATH FROM NODE 950.00 TO NODE 960.00 = 5439.00 FEET.
=====
*****
FLOW PROCESS FROM NODE 960.00 TO NODE 965.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 905.00 DOWNSTREAM(FEET) = 870.00
FLOW LENGTH(FEET) = 947.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 51.0 INCH PIPE IS 37.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 25.15
ESTIMATED PIPE DIAMETER(INCH) = 51.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 277.33
PIPE TRAVEL TIME(MIN.) = 0.63 Tc(MIN.) = 17.62
LONGEST FLOWPATH FROM NODE 950.00 TO NODE 965.00 = 6386.00 FEET.
=====
*****
FLOW PROCESS FROM NODE 965.00 TO NODE 970.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 870.00 DOWNSTREAM(FEET) = 770.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 600.00 CHANNEL SLOPE = 0.1667
NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 277.33
FLOW VELOCITY(FEET/SEC) = 20.54 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 0.49 Tc(MIN.) = 18.10
LONGEST FLOWPATH FROM NODE 950.00 TO NODE 970.00 = 6986.00 FEET.
=====
*****
FLOW PROCESS FROM NODE 965.00 TO NODE 970.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.562
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 3.61 SUBAREA RUNOFF(CFS) = 4.50
TOTAL AREA(ACRES) = 213.2 TOTAL RUNOFF(CFS) = 277.33
TC(MIN.) = 18.10
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
=====
*****
FLOW PROCESS FROM NODE 970.00 TO NODE 970.00 IS CODE = 10
-----
*****
** MAIN STREAM CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 493.08 22.86 3.064 459.78
LONGEST FLOWPATH FROM NODE 967.00 TO NODE 970.00 = 7459.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 277.33 18.10 3.562 213.18
LONGEST FLOWPATH FROM NODE 950.00 TO NODE 970.00 = 6986.00 FEET.

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 667.74 18.10 3.562
2 731.64 22.86 3.064

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COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =      731.64    Tc(MIN.) =    22.86
TOTAL AREA(ACRES) =      673.0

*****
FLOW PROCESS FROM NODE    970.00 TO NODE    971.00 IS CODE =  52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =    770.00  DOWNSTREAM(FEET) =    630.00
CHANNEL LENGTH THRU SUBAREA(FEET) =  3900.00  CHANNEL SLOPE =  0.0359
CHANNEL FLOW THRU SUBAREA(CFS) =    731.64
FLOW VELOCITY(FEET/SEC) =  16.77 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =    3.88    Tc(MIN.) =    26.74
LONGEST FLOWPATH FROM NODE    967.00 TO NODE    971.00 =   11359.00 FEET.

*****
FLOW PROCESS FROM NODE    970.00 TO NODE    971.00 IS CODE =  81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.770
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) =    0
AREA-AVERAGE RUNOFF COEFFICIENT =  0.3500
SUBAREA AREA(ACRES) =   151.95  SUBAREA RUNOFF(CFS) =   147.30
TOTAL AREA(ACRES) =    824.9  TOTAL RUNOFF(CFS) =    799.67
TC(MIN.) =    26.74

*****
FLOW PROCESS FROM NODE    970.00 TO NODE    970.00 IS CODE =  12
-----
>>>>CLEAR MEMORY BANK # 1 <<<<
=====
END OF STUDY SUMMARY:
TOTAL AREA(ACRES)      =    824.9  TC(MIN.) =    26.74
PEAK FLOW RATE(CFS)    =    799.67
=====
END OF RATIONAL METHOD ANALYSIS

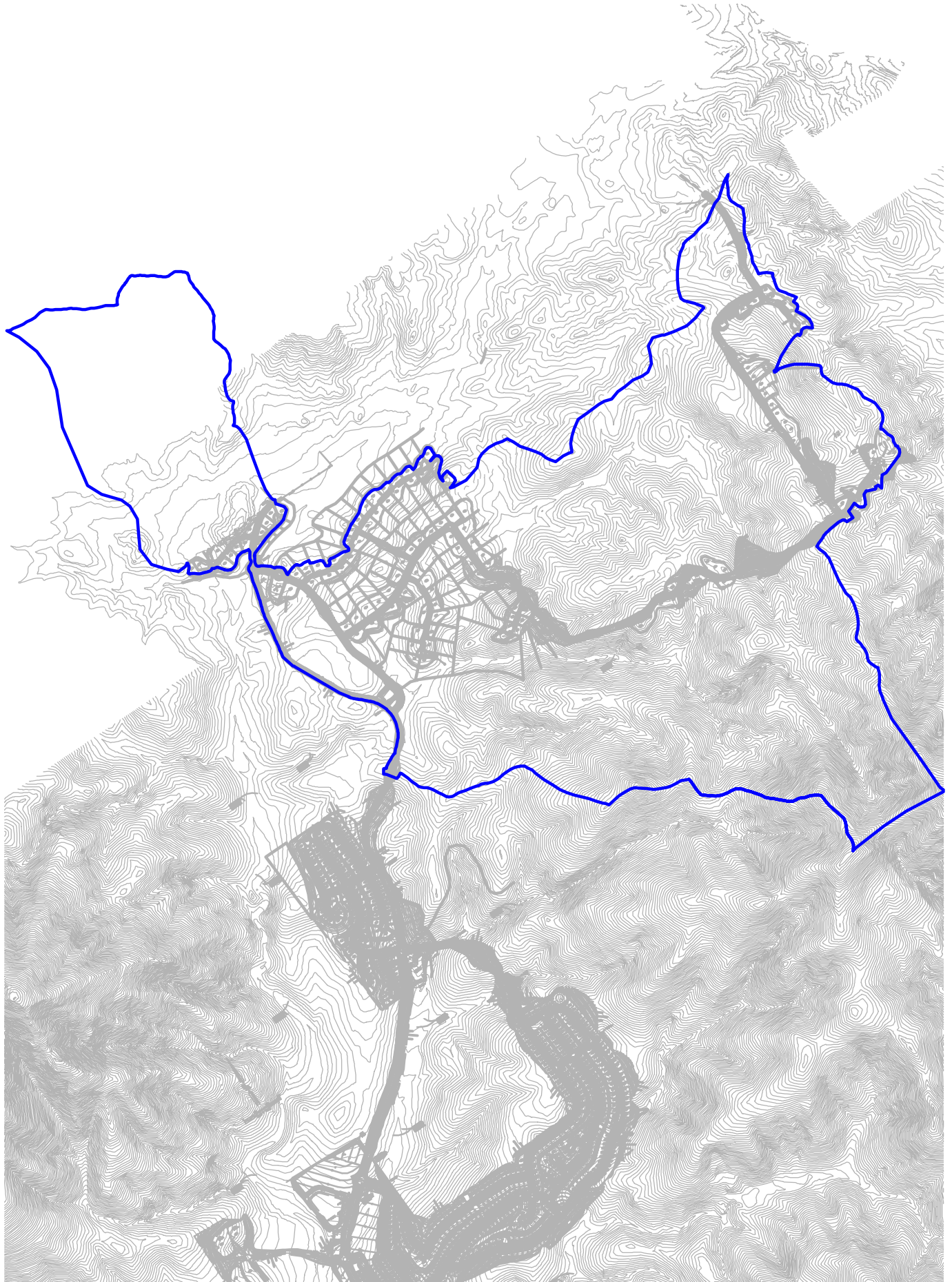
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CHAPTER 6

5.1.6 – Rational Method Hydrologic Analysis (AES 2015)

Drainage Areas Tributary to Planning Areas 16/19 WQ Basins

OTAY RANCH VILLAGE 14 & PA 16/19 DRAINAGE AREAS TRIBUTARY TO PLANNING AREAS 16/19



CHAPTER 5

5.1.7 – Rational Method Proposed Condition Hydrology Maps


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*****
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
          2003,1985,1981 HYDROLOGY MANUAL
(c) Copyright 1982-2015 Advanced Engineering Software (aes)
Ver. 22.0 Release Date: 07/01/2015 License ID 1239

Analysis prepared by:

***** DESCRIPTION OF STUDY *****
* Village 16 North *
* *
* *
*****
FILE NAME: R:\1235\HYD\CALCS\AES\SRP\V16N.DAT
TIME/DATE OF STUDY: 17:52 08/03/2017
-----
USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
-----
2003 SAN DIEGO MANUAL CRITERIA

USER SPECIFIED STORM EVENT(YEAR) = 100.00
6-HOUR DURATION PRECIPITATION (INCHES) = 3.100
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
*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 16.0 8.0 0.020/0.020/0.020 0.50 2.00 0.0313 0.125 0.0150
2 12.0 6.0 0.020/0.020/0.020 0.50 1.50 0.0313 0.125 0.0130

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
1. Relative Flow-Depth = 0.00 FEET
   as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)
*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

*****
FLOW PROCESS FROM NODE 100.00 TO NODE 101.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
-----
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 1900.00
DOWNSTREAM ELEVATION(FEET) = 1890.00
ELEVATION DIFFERENCE(FEET) = 10.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 6.267
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.061
SUBAREA RUNOFF(CFS) = 4.08
TOTAL AREA(ACRES) = 1.65 TOTAL RUNOFF(CFS) = 4.08

*****
FLOW PROCESS FROM NODE 101.00 TO NODE 102.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 1890.00 DOWNSTREAM(FEET) = 1320.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 2803.00 CHANNEL SLOPE = 0.2034
NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 4.08
FLOW VELOCITY(FEET/SEC) = 6.36 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 7.34 Tc(MIN.) = 13.61
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 102.00 = 2903.00 FEET.

*****
FLOW PROCESS FROM NODE 101.00 TO NODE 102.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.282
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 63.62 SUBAREA RUNOFF(CFS) = 95.34
TOTAL AREA(ACRES) = 65.3 TOTAL RUNOFF(CFS) = 97.81
Tc(MIN.) = 13.61

*****
FLOW PROCESS FROM NODE 102.00 TO NODE 103.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 1320.00 DOWNSTREAM(FEET) = 1070.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 2053.00 CHANNEL SLOPE = 0.1218
NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 97.81
FLOW VELOCITY(FEET/SEC) = 14.91 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 2.29 Tc(MIN.) = 15.90
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 103.00 = 4956.00 FEET.

*****
FLOW PROCESS FROM NODE 102.00 TO NODE 103.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.872
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 81.12 SUBAREA RUNOFF(CFS) = 109.94
TOTAL AREA(ACRES) = 146.4 TOTAL RUNOFF(CFS) = 198.40
Tc(MIN.) = 15.90

*****
FLOW PROCESS FROM NODE 103.00 TO NODE 103.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
-----
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 15.90
RAINFALL INTENSITY(INCH/HR) = 3.87
TOTAL STREAM AREA(ACRES) = 146.39
PEAK FLOW RATE(CFS) AT CONFLUENCE = 198.40

*****
FLOW PROCESS FROM NODE 105.00 TO NODE 106.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
-----
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 1200.00
DOWNSTREAM ELEVATION(FEET) = 1195.00
ELEVATION DIFFERENCE(FEET) = 5.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 7.695
WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
THE MAXIMUM OVERLAND FLOW LENGTH = 95.00
(Reference: Table 3-1B of Hydrology Manual)
THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.185
SUBAREA RUNOFF(CFS) = 0.50
TOTAL AREA(ACRES) = 0.23 TOTAL RUNOFF(CFS) = 0.50

*****
FLOW PROCESS FROM NODE 106.00 TO NODE 107.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 1195.00 DOWNSTREAM(FEET) = 1180.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 165.00 CHANNEL SLOPE = 0.0909
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 0.50
FLOW VELOCITY(FEET/SEC) = 4.52 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 0.61 Tc(MIN.) = 8.30
LONGEST FLOWPATH FROM NODE 105.00 TO NODE 107.00 = 265.00 FEET.

*****
FLOW PROCESS FROM NODE 106.00 TO NODE 107.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.889
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 3.10 SUBAREA RUNOFF(CFS) = 6.39
TOTAL AREA(ACRES) = 3.3 TOTAL RUNOFF(CFS) = 6.86
Tc(MIN.) = 8.30

*****
FLOW PROCESS FROM NODE 107.00 TO NODE 108.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<

```

```

=====
ELEVATION DATA: UPSTREAM(FEET) = 1180.00 DOWNSTREAM(FEET) = 1155.00
FLOW LENGTH(FEET) = 512.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 6.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 11.22
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 6.86
PIPE TRAVEL TIME(MIN.) = 0.76 Tc(MIN.) = 9.06
LONGEST FLOWPATH FROM NODE 105.00 TO NODE 108.00 = 777.00 FEET.

*****
FLOW PROCESS FROM NODE 108.00 TO NODE 103.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1155.00 DOWNSTREAM(FEET) = 1070.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1035.00 CHANNEL SLOPE = 0.0821
CHANNEL FLOW THRU SUBAREA(CFS) = 6.86
FLOW VELOCITY(FEET/SEC) = 6.52 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 2.64 Tc(MIN.) = 11.71
LONGEST FLOWPATH FROM NODE 105.00 TO NODE 103.00 = 1812.00 FEET.

*****
FLOW PROCESS FROM NODE 108.00 TO NODE 103.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.718
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 27.52 SUBAREA RUNOFF(CFS) = 45.44
TOTAL AREA(ACRES) = 30.9 TOTAL RUNOFF(CFS) = 50.94
TC(MIN.) = 11.71

*****
FLOW PROCESS FROM NODE 103.00 TO NODE 103.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 11.71
RAINFALL INTENSITY(INCH/HR) = 4.72
TOTAL STREAM AREA(ACRES) = 30.85
PEAK FLOW RATE(CFS) AT CONFLUENCE = 50.94

** CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 198.40 15.90 3.872 146.39
2 50.94 11.71 4.718 30.85

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

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 197.01 11.71 4.718
2 240.21 15.90 3.872

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 240.21 Tc(MIN.) = 15.90
TOTAL AREA(ACRES) = 177.2
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 103.00 = 4956.00 FEET.

*****
FLOW PROCESS FROM NODE 103.00 TO NODE 109.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1070.00 DOWNSTREAM(FEET) = 960.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1882.00 CHANNEL SLOPE = 0.0584
CHANNEL FLOW THRU SUBAREA(CFS) = 240.21
FLOW VELOCITY(FEET/SEC) = 15.01 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 2.09 Tc(MIN.) = 17.99
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 109.00 = 6838.00 FEET.

*****
FLOW PROCESS FROM NODE 103.00 TO NODE 109.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.576
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 41.35 SUBAREA RUNOFF(CFS) = 51.75

TOTAL AREA(ACRES) = 218.6 TOTAL RUNOFF(CFS) = 273.58
TC(MIN.) = 17.99

*****
FLOW PROCESS FROM NODE 109.00 TO NODE 109.00 IS CODE = 10
-----
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
=====
*****
FLOW PROCESS FROM NODE 111.00 TO NODE 112.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 1195.00
DOWNSTREAM ELEVATION(FEET) = 1185.00
ELEVATION DIFFERENCE(FEET) = 10.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 6.267
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.061
SUBAREA RUNOFF(CFS) = 0.82
TOTAL AREA(ACRES) = 0.33 TOTAL RUNOFF(CFS) = 0.82

*****
FLOW PROCESS FROM NODE 112.00 TO NODE 113.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1185.00 DOWNSTREAM(FEET) = 1020.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1480.00 CHANNEL SLOPE = 0.1115
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 0.82
FLOW VELOCITY(FEET/SEC) = 4.74 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 5.20 Tc(MIN.) = 11.47
LONGEST FLOWPATH FROM NODE 111.00 TO NODE 113.00 = 1580.00 FEET.

*****
FLOW PROCESS FROM NODE 112.00 TO NODE 113.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.782
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 23.73 SUBAREA RUNOFF(CFS) = 39.72
TOTAL AREA(ACRES) = 24.1 TOTAL RUNOFF(CFS) = 40.27
TC(MIN.) = 11.47

*****
FLOW PROCESS FROM NODE 113.00 TO NODE 110.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1020.00 DOWNSTREAM(FEET) = 1015.00
FLOW LENGTH(FEET) = 176.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 27.0 INCH PIPE IS 18.1 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 14.19
ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 40.27
PIPE TRAVEL TIME(MIN.) = 0.21 Tc(MIN.) = 11.67
LONGEST FLOWPATH FROM NODE 111.00 TO NODE 110.00 = 1756.00 FEET.

*****
FLOW PROCESS FROM NODE 110.00 TO NODE 110.00 IS CODE = 10
-----
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<
=====
*****
FLOW PROCESS FROM NODE 115.00 TO NODE 116.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 1335.00
DOWNSTREAM ELEVATION(FEET) = 1333.00
ELEVATION DIFFERENCE(FEET) = 2.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 2.988
WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
THE MAXIMUM OVERLAND FLOW LENGTH = 70.00
(Reference: Table 3-1B of Hydrology Manual)
THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 8.168

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NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) = 0.62
TOTAL AREA(ACRES) = 0.09 TOTAL RUNOFF(CFS) = 0.62

*****
FLOW PROCESS FROM NODE 116.00 TO NODE 117.00 IS CODE = 61
-----
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STANDARD CURB SECTION USED)<<<<<
=====
UPSTREAM ELEVATION(FEET) = 1333.00 DOWNSTREAM ELEVATION(FEET) = 1238.00
STREET LENGTH(FEET) = 1212.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 9.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.65
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.26
HALFSTREET FLOOD WIDTH(FEET) = 6.57
AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.14
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.32
STREET FLOW TRAVEL TIME(MIN.) = 3.93 Tc(MIN.) = 6.92
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.625
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .8500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.850
SUBAREA AREA(ACRES) = 1.76 SUBAREA RUNOFF(CFS) = 9.91
TOTAL AREA(ACRES) = 1.9 PEAK FLOW RATE(CFS) = 10.42

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.30 HALFSTREET FLOOD WIDTH(FEET) = 8.79
FLOW VELOCITY(FEET/SEC.) = 5.84 DEPTH*VELOCITY(FT*FT/SEC.) = 1.77
LONGEST FLOWPATH FROM NODE 115.00 TO NODE 117.00 = 1312.00 FEET.

*****
FLOW PROCESS FROM NODE 117.00 TO NODE 121.00 IS CODE = 31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1233.00 DOWNSTREAM(FEET) = 1220.00
FLOW LENGTH(FEET) = 1397.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 21.0 INCH PIPE IS 12.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.70
ESTIMATED PIPE DIAMETER(INCH) = 21.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 10.42
PIPE TRAVEL TIME(MIN.) = 3.47 Tc(MIN.) = 10.39
LONGEST FLOWPATH FROM NODE 115.00 TO NODE 121.00 = 2709.00 FEET.

*****
FLOW PROCESS FROM NODE 121.00 TO NODE 121.00 IS CODE = 1
-----
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 10.39
RAINFALL INTENSITY(INCH/HR) = 5.10
TOTAL STREAM AREA(ACRES) = 1.85
PEAK FLOW RATE(CFS) AT CONFLUENCE = 10.42

*****
FLOW PROCESS FROM NODE 119.00 TO NODE 120.00 IS CODE = 21
-----
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=====
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 1236.35
DOWNSTREAM ELEVATION(FEET) = 1235.35
ELEVATION DIFFERENCE(FEET) = 1.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 9.638
WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
THE MAXIMUM OVERLAND FLOW LENGTH = 70.00
(Reference: Table 3-1B of Hydrology Manual)
THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.349
SUBAREA RUNOFF(CFS) = 0.32
TOTAL AREA(ACRES) = 0.13 TOTAL RUNOFF(CFS) = 0.32

*****
FLOW PROCESS FROM NODE 120.00 TO NODE 121.00 IS CODE = 61
-----
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STANDARD CURB SECTION USED)<<<<<
=====
UPSTREAM ELEVATION(FEET) = 1235.00 DOWNSTREAM ELEVATION(FEET) = 1220.00
STREET LENGTH(FEET) = 1405.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 9.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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) = 4.74
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.32
HALFSTREET FLOOD WIDTH(FEET) = 9.60
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.28
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.73
STREET FLOW TRAVEL TIME(MIN.) = 10.26 Tc(MIN.) = 19.90
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.351
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.460
SUBAREA AREA(ACRES) = 5.56 SUBAREA RUNOFF(CFS) = 8.57
TOTAL AREA(ACRES) = 5.7 PEAK FLOW RATE(CFS) = 8.77

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.38 HALFSTREET FLOOD WIDTH(FEET) = 12.48
FLOW VELOCITY(FEET/SEC.) = 2.62 DEPTH*VELOCITY(FT*FT/SEC.) = 0.98
LONGEST FLOWPATH FROM NODE 119.00 TO NODE 121.00 = 1505.00 FEET.

*****
FLOW PROCESS FROM NODE 121.00 TO NODE 121.00 IS CODE = 1
-----
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 19.90
RAINFALL INTENSITY(INCH/HR) = 3.35
TOTAL STREAM AREA(ACRES) = 5.69
PEAK FLOW RATE(CFS) AT CONFLUENCE = 8.77

** CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 10.42 10.39 5.095 1.85
2 8.77 19.90 3.351 5.69

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

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 15.00 10.39 5.095
2 15.62 19.90 3.351

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 15.62 Tc(MIN.) = 19.90
TOTAL AREA(ACRES) = 7.5
LONGEST FLOWPATH FROM NODE 115.00 TO NODE 121.00 = 2709.00 FEET.

*****
FLOW PROCESS FROM NODE 121.00 TO NODE 122.00 IS CODE = 31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1220.00 DOWNSTREAM(FEET) = 1065.00
FLOW LENGTH(FEET) = 1400.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 8.6 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 18.86
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 15.62
PIPE TRAVEL TIME(MIN.) = 1.24 Tc(MIN.) = 21.14
LONGEST FLOWPATH FROM NODE 115.00 TO NODE 122.00 = 4109.00 FEET.

*****
FLOW PROCESS FROM NODE 122.00 TO NODE 122.00 IS CODE = 1
-----
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 21.14
RAINFALL INTENSITY(INCH/HR) = 3.22
TOTAL STREAM AREA(ACRES) = 7.54
PEAK FLOW RATE(CFS) AT CONFLUENCE = 15.62

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*****
FLOW PROCESS FROM NODE      123.00 TO NODE      124.00 IS CODE =  21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7900
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 1250.00
DOWNSTREAM ELEVATION(FEET) = 1240.00
ELEVATION DIFFERENCE(FEET) = 10.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 2.590
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 8.168
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) = 1.16
TOTAL AREA(ACRES) = 0.18 TOTAL RUNOFF(CFS) = 1.16

*****
FLOW PROCESS FROM NODE      124.00 TO NODE      125.00 IS CODE =  61
-----
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>(STANDARD CURB SECTION USED)<<<<
=====
UPSTREAM ELEVATION(FEET) = 1230.00 DOWNSTREAM ELEVATION(FEET) = 1065.00
STREET LENGTH(FEET) = 1400.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 9.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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) = 7.29
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.26
HALFSTREET FLOOD WIDTH(FEET) = 6.74
AVERAGE FLOW VELOCITY(FEET/SEC.) = 6.36
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.66
STREET FLOW TRAVEL TIME(MIN.) = 3.67 Tc(MIN.) = 6.26
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.067
*USER SPECIFIED(SUBAREA):
NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7900
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.790
SUBAREA AREA(ACRES) = 2.17 SUBAREA RUNOFF(CFS) = 12.12
TOTAL AREA(ACRES) = 2.4 PEAK FLOW RATE(CFS) = 13.12

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.30 HALFSTREET FLOOD WIDTH(FEET) = 8.85
FLOW VELOCITY(FEET/SEC.) = 7.27 DEPTH*VELOCITY(FT*FT/SEC.) = 2.21
LONGEST FLOWPATH FROM NODE 123.00 TO NODE 125.00 = 1500.00 FEET.

*****
FLOW PROCESS FROM NODE      125.00 TO NODE      122.00 IS CODE =  31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1065.00 DOWNSTREAM(FEET) = 1055.00
FLOW LENGTH(FEET) = 33.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 5.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 25.99
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 13.12
PIPE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 6.28
LONGEST FLOWPATH FROM NODE 123.00 TO NODE 122.00 = 1533.00 FEET.

*****
FLOW PROCESS FROM NODE      122.00 TO NODE      122.00 IS CODE =  1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 6.28
RAINFALL INTENSITY(INCH/HR) = 7.05
TOTAL STREAM AREA(ACRES) = 2.35
PEAK FLOW RATE(CFS) AT CONFLUENCE = 13.12

** CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 15.62 21.14 3.223 7.54
2 13.12 6.28 7.052 2.35

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

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CONFLUENCE FORMULA USED FOR 2 STREAMS.

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** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 20.26 6.28 7.052
2 21.62 21.14 3.223

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 21.62 Tc(MIN.) = 21.14
TOTAL AREA(ACRES) = 9.9
LONGEST FLOWPATH FROM NODE 115.00 TO NODE 122.00 = 4109.00 FEET.

*****
FLOW PROCESS FROM NODE      122.00 TO NODE      126.00 IS CODE =  31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1065.00 DOWNSTREAM(FEET) = 1055.00
FLOW LENGTH(FEET) = 33.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 7.7 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 29.79
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 21.62
PIPE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 21.16
LONGEST FLOWPATH FROM NODE 115.00 TO NODE 126.00 = 4142.00 FEET.

*****
FLOW PROCESS FROM NODE      126.00 TO NODE      110.00 IS CODE =  31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1055.00 DOWNSTREAM(FEET) = 1050.00
FLOW LENGTH(FEET) = 83.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 15.99
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 21.62
PIPE TRAVEL TIME(MIN.) = 0.09 Tc(MIN.) = 21.24
LONGEST FLOWPATH FROM NODE 115.00 TO NODE 110.00 = 4225.00 FEET.

*****
FLOW PROCESS FROM NODE      110.00 TO NODE      110.00 IS CODE =  11
-----
>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<
=====

** MAIN STREAM CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 21.62 21.24 3.213 9.89
LONGEST FLOWPATH FROM NODE 115.00 TO NODE 110.00 = 4225.00 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 40.27 11.67 4.727 24.06
LONGEST FLOWPATH FROM NODE 111.00 TO NODE 110.00 = 1756.00 FEET.

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 52.15 11.67 4.727
2 48.99 21.24 3.213

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 52.15 Tc(MIN.) = 11.67
TOTAL AREA(ACRES) = 34.0

*****
FLOW PROCESS FROM NODE      110.00 TO NODE      110.00 IS CODE =  12
-----
>>>>CLEAR MEMORY BANK # 2 <<<<
=====

*****
FLOW PROCESS FROM NODE      110.00 TO NODE      109.00 IS CODE =  31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1050.00 DOWNSTREAM(FEET) = 970.00
FLOW LENGTH(FEET) = 300.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 14.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 34.10
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 52.15
PIPE TRAVEL TIME(MIN.) = 0.15 Tc(MIN.) = 11.82
LONGEST FLOWPATH FROM NODE 115.00 TO NODE 109.00 = 4525.00 FEET.

*****
FLOW PROCESS FROM NODE      109.00 TO NODE      109.00 IS CODE =  11

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

** MAIN STREAM CONFLUENCE DATA **
STREAM      RUNOFF      Tc      INTENSITY      AREA
NUMBER      (CFS)      (MIN.)      (INCH/ HOUR)      (ACRE)
1           52.15      11.82      4.689           33.95
LONGEST FLOWPATH FROM NODE      115.00 TO NODE      109.00 =      4525.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **
STREAM      RUNOFF      Tc      INTENSITY      AREA
NUMBER      (CFS)      (MIN.)      (INCH/ HOUR)      (ACRE)
1           273.58      17.99      3.576           218.59
LONGEST FLOWPATH FROM NODE      100.00 TO NODE      109.00 =      6838.00 FEET.

** PEAK FLOW RATE TABLE **
STREAM      RUNOFF      Tc      INTENSITY
NUMBER      (CFS)      (MIN.)      (INCH/ HOUR)
1           231.87      11.82      4.689
2           313.35      17.99      3.576

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =      313.35      Tc(MIN.) =      17.99
TOTAL AREA(ACRES) =      252.5

*****
FLOW PROCESS FROM NODE      109.00 TO NODE      109.00 IS CODE =      12
-----
>>>>CLEAR MEMORY BANK # 1 <<<<
=====

*****
FLOW PROCESS FROM NODE      109.00 TO NODE      127.00 IS CODE =      52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =      970.00      DOWNSTREAM(FEET) =      905.00
CHANNEL LENGTH THRU SUBAREA(FEET) =      1297.00      CHANNEL SLOPE =      0.0501
CHANNEL FLOW THRU SUBAREA(CFS) =      313.35
FLOW VELOCITY(FEET/SEC) =      15.11 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =      1.43      Tc(MIN.) =      19.42
LONGEST FLOWPATH FROM NODE      100.00 TO NODE      127.00 =      8135.00 FEET.

*****
FLOW PROCESS FROM NODE      109.00 TO NODE      127.00 IS CODE =      81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =      3.404
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) =      0
AREA-AVERAGE RUNOFF COEFFICIENT =      0.3593
SUBAREA AREA(ACRES) =      26.39      SUBAREA RUNOFF(CFS) =      31.44
TOTAL AREA(ACRES) =      278.9      TOTAL RUNOFF(CFS) =      341.09
Tc(MIN.) =      19.42

*****
FLOW PROCESS FROM NODE      127.00 TO NODE      127.00 IS CODE =      10
-----
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
=====

*****
FLOW PROCESS FROM NODE      129.00 TO NODE      130.00 IS CODE =      21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) =      0
INITIAL SUBAREA FLOW-LENGTH(FEET) =      100.00
UPSTREAM ELEVATION(FEET) =      1660.00
DOWNSTREAM ELEVATION(FEET) =      1650.00
ELEVATION DIFFERENCE(FEET) =      10.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) =      6.267
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =      7.061
SUBAREA RUNOFF(CFS) =      0.59
TOTAL AREA(ACRES) =      0.24      TOTAL RUNOFF(CFS) =      0.59

*****
FLOW PROCESS FROM NODE      130.00 TO NODE      131.00 IS CODE =      52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =      1650.00      DOWNSTREAM(FEET) =      1200.00
CHANNEL LENGTH THRU SUBAREA(FEET) =      2536.00      CHANNEL SLOPE =      0.1774
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) =      0.59
FLOW VELOCITY(FEET/SEC) =      4.74 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)

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TRAVEL TIME(MIN.) =      8.91      Tc(MIN.) =      15.18
LONGEST FLOWPATH FROM NODE      129.00 TO NODE      131.00 =      2636.00 FEET.

*****
FLOW PROCESS FROM NODE      130.00 TO NODE      131.00 IS CODE =      81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =      3.991
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) =      0
AREA-AVERAGE RUNOFF COEFFICIENT =      0.3500
SUBAREA AREA(ACRES) =      47.26      SUBAREA RUNOFF(CFS) =      66.01
TOTAL AREA(ACRES) =      47.5      TOTAL RUNOFF(CFS) =      66.35
Tc(MIN.) =      15.18

*****
FLOW PROCESS FROM NODE      131.00 TO NODE      132.00 IS CODE =      31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =      1200.00      DOWNSTREAM(FEET) =      1100.00
FLOW LENGTH(FEET) =      534.00      MANNING'S N =      0.013
DEPTH OF FLOW IN 21.0 INCH PIPE IS 17.1 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =      31.68
ESTIMATED PIPE DIAMETER(INCH) =      21.00      NUMBER OF PIPES =      1
PIPE-FLOW(CFS) =      66.35
PIPE TRAVEL TIME(MIN.) =      0.28      Tc(MIN.) =      15.46
LONGEST FLOWPATH FROM NODE      129.00 TO NODE      132.00 =      3170.00 FEET.

*****
FLOW PROCESS FROM NODE      132.00 TO NODE      133.00 IS CODE =      52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =      1100.00      DOWNSTREAM(FEET) =      995.00
CHANNEL LENGTH THRU SUBAREA(FEET) =      2700.00      CHANNEL SLOPE =      0.0389
CHANNEL FLOW THRU SUBAREA(CFS) =      66.35
FLOW VELOCITY(FEET/SEC) =      8.29 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =      5.43      Tc(MIN.) =      20.89
LONGEST FLOWPATH FROM NODE      129.00 TO NODE      133.00 =      5870.00 FEET.

*****
FLOW PROCESS FROM NODE      132.00 TO NODE      133.00 IS CODE =      81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =      3.248
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) =      0
AREA-AVERAGE RUNOFF COEFFICIENT =      0.3500
SUBAREA AREA(ACRES) =      170.51      SUBAREA RUNOFF(CFS) =      193.83
TOTAL AREA(ACRES) =      218.0      TOTAL RUNOFF(CFS) =      247.82
Tc(MIN.) =      20.89

*****
FLOW PROCESS FROM NODE      133.00 TO NODE      134.00 IS CODE =      52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =      995.00      DOWNSTREAM(FEET) =      950.00
CHANNEL LENGTH THRU SUBAREA(FEET) =      2000.00      CHANNEL SLOPE =      0.0225
CHANNEL FLOW THRU SUBAREA(CFS) =      247.82
FLOW VELOCITY(FEET/SEC) =      9.40 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =      3.54      Tc(MIN.) =      24.43
LONGEST FLOWPATH FROM NODE      129.00 TO NODE      134.00 =      7870.00 FEET.

*****
FLOW PROCESS FROM NODE      133.00 TO NODE      134.00 IS CODE =      81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =      2.936
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) =      0
AREA-AVERAGE RUNOFF COEFFICIENT =      0.3500
SUBAREA AREA(ACRES) =      87.55      SUBAREA RUNOFF(CFS) =      89.95
TOTAL AREA(ACRES) =      305.6      TOTAL RUNOFF(CFS) =      313.95
Tc(MIN.) =      24.43

*****
FLOW PROCESS FROM NODE      134.00 TO NODE      135.00 IS CODE =      31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =      950.00      DOWNSTREAM(FEET) =      940.00
FLOW LENGTH(FEET) =      332.00      MANNING'S N =      0.013
DEPTH OF FLOW IN 54.0 INCH PIPE IS 41.8 INCHES

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PIPE-FLOW VELOCITY(FEET/SEC.) = 23.79
ESTIMATED PIPE DIAMETER(INCH) = 54.00    NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 313.95
PIPE TRAVEL TIME(MIN.) = 0.23    Tc(MIN.) = 24.67
LONGEST FLOWPATH FROM NODE 129.00 TO NODE 135.00 = 8202.00 FEET.

*****
FLOW PROCESS FROM NODE 135.00 TO NODE 136.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 940.00 DOWNSTREAM(FEET) = 925.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 480.00 CHANNEL SLOPE = 0.0313
CHANNEL FLOW THRU SUBAREA(CFS) = 313.95
FLOW VELOCITY(FEET/SEC) = 11.94 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 0.67 Tc(MIN.) = 25.34
LONGEST FLOWPATH FROM NODE 129.00 TO NODE 136.00 = 8682.00 FEET.

*****
FLOW PROCESS FROM NODE 135.00 TO NODE 136.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.868
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 5.68 SUBAREA RUNOFF(CFS) = 5.70
TOTAL AREA(ACRES) = 311.2 TOTAL RUNOFF(CFS) = 313.95
TC(MIN.) = 25.34
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

*****
FLOW PROCESS FROM NODE 136.00 TO NODE 136.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 25.34
RAINFALL INTENSITY(INCH/HR) = 2.87
TOTAL STREAM AREA(ACRES) = 311.24
PEAK FLOW RATE(CFS) AT CONFLUENCE = 313.95

*****
FLOW PROCESS FROM NODE 138.00 TO NODE 139.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 1030.00
DOWNSTREAM ELEVATION(FEET) = 1020.00
ELEVATION DIFFERENCE(FEET) = 10.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 6.267
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.061
SUBAREA RUNOFF(CFS) = 1.41
TOTAL AREA(ACRES) = 0.57 TOTAL RUNOFF(CFS) = 1.41

*****
FLOW PROCESS FROM NODE 139.00 TO NODE 136.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1020.00 DOWNSTREAM(FEET) = 925.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1657.00 CHANNEL SLOPE = 0.0573
CHANNEL FLOW THRU SUBAREA(CFS) = 1.41
FLOW VELOCITY(FEET/SEC) = 3.84 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 7.20 Tc(MIN.) = 13.46
LONGEST FLOWPATH FROM NODE 138.00 TO NODE 136.00 = 1757.00 FEET.

*****
FLOW PROCESS FROM NODE 139.00 TO NODE 136.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.311
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 12.90 SUBAREA RUNOFF(CFS) = 19.47
TOTAL AREA(ACRES) = 13.5 TOTAL RUNOFF(CFS) = 20.33
TC(MIN.) = 13.46

*****
FLOW PROCESS FROM NODE 136.00 TO NODE 136.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
=====
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 13.46
RAINFALL INTENSITY(INCH/HR) = 4.31
TOTAL STREAM AREA(ACRES) = 13.47
PEAK FLOW RATE(CFS) AT CONFLUENCE = 20.33

** CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 313.95 25.34 2.868 311.24
2 20.33 13.46 4.311 13.47

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

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 187.17 13.46 4.311
2 327.47 25.34 2.868

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 327.47 Tc(MIN.) = 25.34
TOTAL AREA(ACRES) = 324.7
LONGEST FLOWPATH FROM NODE 129.00 TO NODE 136.00 = 8682.00 FEET.

*****
FLOW PROCESS FROM NODE 136.00 TO NODE 127.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 925.00 DOWNSTREAM(FEET) = 905.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1059.00 CHANNEL SLOPE = 0.0189
CHANNEL FLOW THRU SUBAREA(CFS) = 327.47
FLOW VELOCITY(FEET/SEC) = 9.40 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 1.88 Tc(MIN.) = 27.21
LONGEST FLOWPATH FROM NODE 129.00 TO NODE 127.00 = 9741.00 FEET.

*****
FLOW PROCESS FROM NODE 136.00 TO NODE 127.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.739
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 11.54 SUBAREA RUNOFF(CFS) = 11.06
TOTAL AREA(ACRES) = 336.2 TOTAL RUNOFF(CFS) = 327.47
TC(MIN.) = 27.21
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

*****
FLOW PROCESS FROM NODE 127.00 TO NODE 127.00 IS CODE = 10
-----
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<
=====

*****
FLOW PROCESS FROM NODE 141.00 TO NODE 142.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .4100
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 70.00
UPSTREAM ELEVATION(FEET) = 985.00
DOWNSTREAM ELEVATION(FEET) = 984.00
ELEVATION DIFFERENCE(FEET) = 1.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 9.179
WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
THE MAXIMUM OVERLAND FLOW LENGTH = 69.29
(Reference: Table 3-1B of Hydrology Manual)
THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.520
SUBAREA RUNOFF(CFS) = 2.29
TOTAL AREA(ACRES) = 1.01 TOTAL RUNOFF(CFS) = 2.29

*****
FLOW PROCESS FROM NODE 142.00 TO NODE 143.00 IS CODE = 61
-----
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>(STANDARD CURB SECTION USED)<<<<
=====
UPSTREAM ELEVATION(FEET) = 984.00 DOWNSTREAM ELEVATION(FEET) = 937.00
STREET LENGTH(FEET) = 840.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 9.00

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INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curb) = 0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.44
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.31
HALFSTREET FLOOD WIDTH(FEET) = 9.04
AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.05
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.55
STREET FLOW TRAVEL TIME(MIN.) = 2.77 Tc(MIN.) = 11.95
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.656
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .4100
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.410
SUBAREA AREA(ACRES) = 7.47 SUBAREA RUNOFF(CFS) = 14.26
TOTAL AREA(ACRES) = 8.5 PEAK FLOW RATE(CFS) = 16.19

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.35 HALFSTREET FLOOD WIDTH(FEET) = 11.43
FLOW VELOCITY(FEET/SEC.) = 5.69 DEPTH*VELOCITY(FT*FT/SEC.) = 2.02
LONGEST FLOWPATH FROM NODE 141.00 TO NODE 143.00 = 910.00 FEET.

*****
FLOW PROCESS FROM NODE 143.00 TO NODE 144.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 930.00 DOWNSTREAM(FEET) = 920.00
FLOW LENGTH(FEET) = 166.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 10.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 15.11
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 16.19
PIPE TRAVEL TIME(MIN.) = 0.18 Tc(MIN.) = 12.13
LONGEST FLOWPATH FROM NODE 141.00 TO NODE 144.00 = 1076.00 FEET.

*****
FLOW PROCESS FROM NODE 144.00 TO NODE 127.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 920.00 DOWNSTREAM(FEET) = 905.00
FLOW LENGTH(FEET) = 191.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 9.7 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 16.73
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 16.19
PIPE TRAVEL TIME(MIN.) = 0.19 Tc(MIN.) = 12.32
LONGEST FLOWPATH FROM NODE 141.00 TO NODE 127.00 = 1267.00 FEET.

*****
FLOW PROCESS FROM NODE 127.00 TO NODE 127.00 IS CODE = 11
-----
>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<
-----
** MAIN STREAM CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 16.19 12.32 4.564 8.48
LONGEST FLOWPATH FROM NODE 141.00 TO NODE 127.00 = 1267.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 341.09 19.42 3.404 278.93
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 127.00 = 8135.00 FEET.

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 232.61 12.32 4.564
2 353.16 19.42 3.404

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 353.16 Tc(MIN.) = 19.42
TOTAL AREA(ACRES) = 287.4

*****
FLOW PROCESS FROM NODE 127.00 TO NODE 127.00 IS CODE = 11
-----
>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<
-----
** MAIN STREAM CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 353.16 19.42 3.404 287.41
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 127.00 = 8135.00 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 327.47 27.21 2.739 336.25
LONGEST FLOWPATH FROM NODE 129.00 TO NODE 127.00 = 9741.00 FEET.

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 586.91 19.42 3.404
2 611.61 27.21 2.739

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 611.61 Tc(MIN.) = 27.21
TOTAL AREA(ACRES) = 623.7

*****
FLOW PROCESS FROM NODE 127.00 TO NODE 127.00 IS CODE = 12
-----
>>>>CLEAR MEMORY BANK # 1 <<<<
-----
*****
FLOW PROCESS FROM NODE 127.00 TO NODE 127.00 IS CODE = 12
-----
>>>>CLEAR MEMORY BANK # 2 <<<<
-----
*****
FLOW PROCESS FROM NODE 127.00 TO NODE 145.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 905.00 DOWNSTREAM(FEET) = 882.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 991.00 CHANNEL SLOPE = 0.0232
CHANNEL FLOW THRU SUBAREA(CFS) = 611.61
FLOW VELOCITY(FEET/SEC) = 12.73 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 1.30 Tc(MIN.) = 28.51
LONGEST FLOWPATH FROM NODE 129.00 TO NODE 145.00 = 10732.00 FEET.

*****
FLOW PROCESS FROM NODE 127.00 TO NODE 145.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.657
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3549
SUBAREA AREA(ACRES) = 4.17 SUBAREA RUNOFF(CFS) = 3.88
TOTAL AREA(ACRES) = 627.8 TOTAL RUNOFF(CFS) = 611.61
Tc(MIN.) = 28.51
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

*****
FLOW PROCESS FROM NODE 145.00 TO NODE 145.00 IS CODE = 10
-----
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
-----
*****
FLOW PROCESS FROM NODE 147.00 TO NODE 148.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
-----
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 1455.00
DOWNSTREAM ELEVATION(FEET) = 1440.00
ELEVATION DIFFERENCE(FEET) = 15.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 6.267
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.061
SUBAREA RUNOFF(CFS) = 0.67
TOTAL AREA(ACRES) = 0.27 TOTAL RUNOFF(CFS) = 0.67

*****
FLOW PROCESS FROM NODE 148.00 TO NODE 149.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 1430.00 DOWNSTREAM(FEET) = 975.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 2769.00 CHANNEL SLOPE = 0.1643
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 0.67

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FLOW VELOCITY(FEET/SEC) = 4.74 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 9.73 Tc(MIN.) = 16.00
LONGEST FLOWPATH FROM NODE 147.00 TO NODE 149.00 = 2869.00 FEET.

*****
FLOW PROCESS FROM NODE 148.00 TO NODE 149.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.858
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 58.35 SUBAREA RUNOFF(CFS) = 78.79
TOTAL AREA(ACRES) = 58.6 TOTAL RUNOFF(CFS) = 79.15
Tc(MIN.) = 16.00

*****
FLOW PROCESS FROM NODE 149.00 TO NODE 145.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 975.00 DOWNSTREAM(FEET) = 882.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1855.00 CHANNEL SLOPE = 0.0501
CHANNEL FLOW THRU SUBAREA(CFS) = 79.15
FLOW VELOCITY(FEET/SEC) = 9.91 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 3.12 Tc(MIN.) = 19.11
LONGEST FLOWPATH FROM NODE 147.00 TO NODE 145.00 = 4724.00 FEET.

*****
FLOW PROCESS FROM NODE 149.00 TO NODE 145.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.439
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 51.56 SUBAREA RUNOFF(CFS) = 62.06
TOTAL AREA(ACRES) = 110.2 TOTAL RUNOFF(CFS) = 132.62
Tc(MIN.) = 19.11

*****
FLOW PROCESS FROM NODE 145.00 TO NODE 145.00 IS CODE = 10
-----
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<
=====
*****
FLOW PROCESS FROM NODE 151.00 TO NODE 152.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 970.00
DOWNSTREAM ELEVATION(FEET) = 960.00
ELEVATION DIFFERENCE(FEET) = 10.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 6.267
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.061
SUBAREA RUNOFF(CFS) = 0.84
TOTAL AREA(ACRES) = 0.34 TOTAL RUNOFF(CFS) = 0.84

*****
FLOW PROCESS FROM NODE 152.00 TO NODE 145.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 960.00 DOWNSTREAM(FEET) = 882.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1990.00 CHANNEL SLOPE = 0.0392
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 0.84
FLOW VELOCITY(FEET/SEC) = 2.97 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 11.17 Tc(MIN.) = 17.43
LONGEST FLOWPATH FROM NODE 151.00 TO NODE 145.00 = 2090.00 FEET.

*****
FLOW PROCESS FROM NODE 152.00 TO NODE 145.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.649
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 17.09 SUBAREA RUNOFF(CFS) = 21.83
TOTAL AREA(ACRES) = 17.4 TOTAL RUNOFF(CFS) = 22.26

*****
TC(MIN.) = 17.43

*****
FLOW PROCESS FROM NODE 145.00 TO NODE 145.00 IS CODE = 11
-----
>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<
=====
** MAIN STREAM CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 22.26 17.43 3.649 17.43
LONGEST FLOWPATH FROM NODE 151.00 TO NODE 145.00 = 2090.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 611.61 28.51 2.657 627.83
LONGEST FLOWPATH FROM NODE 129.00 TO NODE 145.00 = 10732.00 FEET.

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 396.29 17.43 3.649
2 627.82 28.51 2.657

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 627.82 Tc(MIN.) = 28.51
TOTAL AREA(ACRES) = 645.3

*****
FLOW PROCESS FROM NODE 145.00 TO NODE 145.00 IS CODE = 11
-----
>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<
=====
** MAIN STREAM CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 627.82 28.51 2.657 645.26
LONGEST FLOWPATH FROM NODE 129.00 TO NODE 145.00 = 10732.00 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 132.62 19.11 3.439 110.18
LONGEST FLOWPATH FROM NODE 147.00 TO NODE 145.00 = 4724.00 FEET.

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 553.56 19.11 3.439
2 730.30 28.51 2.657

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 730.30 Tc(MIN.) = 28.51
TOTAL AREA(ACRES) = 755.4

*****
FLOW PROCESS FROM NODE 145.00 TO NODE 145.00 IS CODE = 12
-----
>>>>CLEAR MEMORY BANK # 1 <<<<
=====
*****
FLOW PROCESS FROM NODE 145.00 TO NODE 145.00 IS CODE = 12
-----
>>>>CLEAR MEMORY BANK # 2 <<<<
=====
*****
FLOW PROCESS FROM NODE 145.00 TO NODE 146.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 882.00 DOWNSTREAM(FEET) = 881.00
FLOW LENGTH(FEET) = 50.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 81.0 INCH PIPE IS 60.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 25.32
ESTIMATED PIPE DIAMETER(INCH) = 81.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 730.30
PIPE TRAVEL TIME(MIN.) = 0.03 Tc(MIN.) = 28.54
LONGEST FLOWPATH FROM NODE 129.00 TO NODE 146.00 = 10782.00 FEET.

*****
FLOW PROCESS FROM NODE 146.00 TO NODE 146.00 IS CODE = 10
-----
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
=====
*****
FLOW PROCESS FROM NODE 154.00 TO NODE 155.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

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=====
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(Feet) = 70.00
UPSTREAM ELEVATION(Feet) = 1030.00
DOWNSTREAM ELEVATION(Feet) = 1029.00
ELEVATION DIFFERENCE(Feet) = 1.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 9.978
WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
THE MAXIMUM OVERLAND FLOW LENGTH = 69.29
(Reference: Table 3-1B of Hydrology Manual)
THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.231
SUBAREA RUNOFF(CFS) = 0.48
TOTAL AREA(ACRES) = 0.26 TOTAL RUNOFF(CFS) = 0.48

*****
FLOW PROCESS FROM NODE 155.00 TO NODE 156.00 IS CODE = 61
-----
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>(STANDARD CURB SECTION USED)<<<<
=====
UPSTREAM ELEVATION(Feet) = 1029.00 DOWNSTREAM ELEVATION(Feet) = 995.00
STREET LENGTH(Feet) = 1392.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(Feet) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(Feet) = 9.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curb) = 0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.33
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(Feet) = 0.30
HALFSTREET FLOOD WIDTH(Feet) = 8.44
AVERAGE FLOW VELOCITY(Feet/Sec.) = 3.21
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.95
STREET FLOW TRAVEL TIME(MIN.) = 7.23 Tc(MIN.) = 17.21
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.680
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .5200
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.512
SUBAREA AREA(ACRES) = 5.08 SUBAREA RUNOFF(CFS) = 9.72
TOTAL AREA(ACRES) = 5.3 PEAK FLOW RATE(CFS) = 10.06

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(Feet) = 0.35 HALFSTREET FLOOD WIDTH(Feet) = 11.14
FLOW VELOCITY(Feet/Sec.) = 3.70 DEPTH*VELOCITY(FT*FT/SEC.) = 1.29
LONGEST FLOWPATH FROM NODE 154.00 TO NODE 156.00 = 1462.00 FEET.

*****
FLOW PROCESS FROM NODE 156.00 TO NODE 160.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(Feet) = 995.00 DOWNSTREAM(Feet) = 985.00
FLOW LENGTH(Feet) = 1783.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 21.0 INCH PIPE IS 15.1 INCHES
PIPE-FLOW VELOCITY(Feet/Sec.) = 5.42
ESTIMATED PIPE DIAMETER(INCH) = 21.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 10.06
PIPE TRAVEL TIME(MIN.) = 5.49 Tc(MIN.) = 22.70
LONGEST FLOWPATH FROM NODE 154.00 TO NODE 160.00 = 3245.00 FEET.

*****
FLOW PROCESS FROM NODE 160.00 TO NODE 160.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 22.70
RAINFALL INTENSITY(INCH/HR) = 3.08
TOTAL STREAM AREA(ACRES) = 5.34
PEAK FLOW RATE(CFS) AT CONFLUENCE = 10.06

*****
FLOW PROCESS FROM NODE 158.00 TO NODE 159.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(Feet) = 70.00
UPSTREAM ELEVATION(Feet) = 1000.00
DOWNSTREAM ELEVATION(Feet) = 999.00
ELEVATION DIFFERENCE(Feet) = 1.00

SUBAREA OVERLAND TIME OF FLOW(MIN.) = 7.756
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.154
SUBAREA RUNOFF(CFS) = 0.74
TOTAL AREA(ACRES) = 0.23 TOTAL RUNOFF(CFS) = 0.74

*****
FLOW PROCESS FROM NODE 159.00 TO NODE 160.00 IS CODE = 61
-----
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>(STANDARD CURB SECTION USED)<<<<
=====
UPSTREAM ELEVATION(Feet) = 995.00 DOWNSTREAM ELEVATION(Feet) = 985.00
STREET LENGTH(Feet) = 1700.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(Feet) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(Feet) = 9.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curb) = 0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.80
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(Feet) = 0.45
HALFSTREET FLOOD WIDTH(Feet) = 16.35
AVERAGE FLOW VELOCITY(Feet/Sec.) = 2.29
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.04
STREET FLOW TRAVEL TIME(MIN.) = 12.35 Tc(MIN.) = 20.11
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.329
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.520
SUBAREA AREA(ACRES) = 13.08 SUBAREA RUNOFF(CFS) = 22.64
TOTAL AREA(ACRES) = 13.3 PEAK FLOW RATE(CFS) = 23.04

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(Feet) = 0.53 HALFSTREET FLOOD WIDTH(Feet) = 19.42
FLOW VELOCITY(Feet/Sec.) = 2.79 DEPTH*VELOCITY(FT*FT/SEC.) = 1.47
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 1700.0 FT WITH ELEVATION-DROP = 10.0 FT, IS 37.7 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 160.00
LONGEST FLOWPATH FROM NODE 158.00 TO NODE 160.00 = 1770.00 FEET.

*****
FLOW PROCESS FROM NODE 160.00 TO NODE 160.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 20.11
RAINFALL INTENSITY(INCH/HR) = 3.33
TOTAL STREAM AREA(ACRES) = 13.31
PEAK FLOW RATE(CFS) AT CONFLUENCE = 23.04

** CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 10.06 22.70 3.079 5.34
2 23.04 20.11 3.329 13.31

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

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 31.95 20.11 3.329
2 31.36 22.70 3.079

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 31.95 Tc(MIN.) = 20.11
TOTAL AREA(ACRES) = 18.6
LONGEST FLOWPATH FROM NODE 154.00 TO NODE 160.00 = 3245.00 FEET.

*****
FLOW PROCESS FROM NODE 160.00 TO NODE 164.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(Feet) = 985.00 DOWNSTREAM(Feet) = 940.00
FLOW LENGTH(Feet) = 1335.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 24.0 INCH PIPE IS 16.1 INCHES
PIPE-FLOW VELOCITY(Feet/Sec.) = 14.28
ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 31.95
PIPE TRAVEL TIME(MIN.) = 1.56 Tc(MIN.) = 21.66
LONGEST FLOWPATH FROM NODE 154.00 TO NODE 164.00 = 4580.00 FEET.

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*****
FLOW PROCESS FROM NODE    164.00 TO NODE    164.00 IS CODE =    1
-----
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
=====
TOTAL NUMBER OF STREAMS =    2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
TIME OF CONCENTRATION(MIN.) =    21.66
RAINFALL INTENSITY(INCH/HR) =    3.17
TOTAL STREAM AREA(ACRES) =    18.65
PEAK FLOW RATE(CFS) AT CONFLUENCE =    31.95

*****
FLOW PROCESS FROM NODE    162.00 TO NODE    163.00 IS CODE =    21
-----
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=====
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
S.C.S. CURVE NUMBER (AMC II) =    0
INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
UPSTREAM ELEVATION(FEET) =    992.00
DOWNSTREAM ELEVATION(FEET) =    991.00
ELEVATION DIFFERENCE(FEET) =    1.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.756
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =    6.154
SUBAREA RUNOFF(CFS) =    0.77
TOTAL AREA(ACRES) =    0.24 TOTAL RUNOFF(CFS) =    0.77

*****
FLOW PROCESS FROM NODE    163.00 TO NODE    164.00 IS CODE =    61
-----
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STANDARD CURB SECTION USED)<<<<<
=====
UPSTREAM ELEVATION(FEET) =    991.00 DOWNSTREAM ELEVATION(FEET) =    940.00
STREET LENGTH(FEET) =    1509.00 CURB HEIGHT(INCHES) =    6.0
STREET HALFWIDTH(FEET) =    18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =    9.00
INSIDE STREET CROSSFALL(DECIMAL) =    0.020
OUTSIDE STREET CROSSFALL(DECIMAL) =    0.020

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) =    19.63
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) =    0.40
HALFSTREET FLOOD WIDTH(FEET) =    13.68
AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.94
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.97
STREET FLOW TRAVEL TIME(MIN.) =    5.09 Tc(MIN.) =    12.85
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =    4.443
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .5200
S.C.S. CURVE NUMBER (AMC II) =    0
AREA-AVERAGE RUNOFF COEFFICIENT =    0.520
SUBAREA AREA(ACRES) =    16.05 SUBAREA RUNOFF(CFS) =    37.08
TOTAL AREA(ACRES) =    16.3 PEAK FLOW RATE(CFS) =    37.64

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) =    0.48 HALFSTREET FLOOD WIDTH(FEET) =    17.75
FLOW VELOCITY(FEET/SEC.) =    5.75 DEPTH*VELOCITY(FT*FT/SEC.) =    2.77
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
      AND L = 1509.0 FT WITH ELEVATION-DROP =    51.0 FT, IS    55.8 CFS,
      WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    164.00
LONGEST FLOWPATH FROM NODE    162.00 TO NODE    164.00 =    1579.00 FEET.

*****
FLOW PROCESS FROM NODE    164.00 TO NODE    164.00 IS CODE =    1
-----
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
=====
TOTAL NUMBER OF STREAMS =    2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
TIME OF CONCENTRATION(MIN.) =    12.85
RAINFALL INTENSITY(INCH/HR) =    4.44
TOTAL STREAM AREA(ACRES) =    16.29
PEAK FLOW RATE(CFS) AT CONFLUENCE =    37.64

** CONFLUENCE DATA **
STREAM  RUNOFF      Tc      INTENSITY      AREA
NUMBER  (CFS)      (MIN.)  (INCH/HOUR)  (ACRE)
-----
1        31.95     21.66      3.172      18.65
2        37.64     12.85      4.443      16.29

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

** PEAK FLOW RATE TABLE **
STREAM  RUNOFF      Tc      INTENSITY

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NUMBER      (CFS)      (MIN.)  (INCH/HOUR)
-----
1         60.45     12.85      4.443
2         58.82     21.66      3.172

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =    60.45 Tc(MIN.) =    12.85
TOTAL AREA(ACRES) =    34.9
LONGEST FLOWPATH FROM NODE    154.00 TO NODE    164.00 =    4580.00 FEET.

*****
FLOW PROCESS FROM NODE    164.00 TO NODE    168.00 IS CODE =    31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =    940.00 DOWNSTREAM(FEET) =    912.00
FLOW LENGTH(FEET) =    798.00 MANNING'S N =    0.013
DEPTH OF FLOW IN 30.0 INCH PIPE IS 20.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =    16.98
ESTIMATED PIPE DIAMETER(INCH) =    30.00 NUMBER OF PIPES =    1
PIPE-FLOW(CFS) =    60.45
PIPE TRAVEL TIME(MIN.) =    0.78 Tc(MIN.) =    13.63
LONGEST FLOWPATH FROM NODE    154.00 TO NODE    168.00 =    5378.00 FEET.

*****
FLOW PROCESS FROM NODE    168.00 TO NODE    168.00 IS CODE =    1
-----
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
=====
TOTAL NUMBER OF STREAMS =    2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
TIME OF CONCENTRATION(MIN.) =    13.63
RAINFALL INTENSITY(INCH/HR) =    4.28
TOTAL STREAM AREA(ACRES) =    34.94
PEAK FLOW RATE(CFS) AT CONFLUENCE =    60.45

*****
FLOW PROCESS FROM NODE    166.00 TO NODE    167.00 IS CODE =    21
-----
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=====
*USER SPECIFIED(SUBAREA):
LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8500
S.C.S. CURVE NUMBER (AMC II) =    0
INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
UPSTREAM ELEVATION(FEET) =    950.00
DOWNSTREAM ELEVATION(FEET) =    948.00
ELEVATION DIFFERENCE(FEET) =    2.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.653
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =    8.168
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) =    1.60
TOTAL AREA(ACRES) =    0.23 TOTAL RUNOFF(CFS) =    1.60

*****
FLOW PROCESS FROM NODE    167.00 TO NODE    168.00 IS CODE =    61
-----
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STANDARD CURB SECTION USED)<<<<<
=====
UPSTREAM ELEVATION(FEET) =    948.00 DOWNSTREAM ELEVATION(FEET) =    892.00
STREET LENGTH(FEET) =    1373.00 CURB HEIGHT(INCHES) =    6.0
STREET HALFWIDTH(FEET) =    18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =    9.00
INSIDE STREET CROSSFALL(DECIMAL) =    0.020
OUTSIDE STREET CROSSFALL(DECIMAL) =    0.020

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) =    10.63
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) =    0.33
HALFSTREET FLOOD WIDTH(FEET) =    10.23
AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.56
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.51
STREET FLOW TRAVEL TIME(MIN.) =    5.01 Tc(MIN.) =    7.67
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =    6.200
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4500
S.C.S. CURVE NUMBER (AMC II) =    0
AREA-AVERAGE RUNOFF COEFFICIENT =    0.465
SUBAREA AREA(ACRES) =    6.01 SUBAREA RUNOFF(CFS) =    16.77
TOTAL AREA(ACRES) =    6.2 PEAK FLOW RATE(CFS) =    17.98

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) =    0.38 HALFSTREET FLOOD WIDTH(FEET) =    12.69
FLOW VELOCITY(FEET/SEC.) =    5.20 DEPTH*VELOCITY(FT*FT/SEC.) =    1.98
LONGEST FLOWPATH FROM NODE    166.00 TO NODE    168.00 =    1443.00 FEET.

*****
FLOW PROCESS FROM NODE    169.00 TO NODE    168.00 IS CODE =    81

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>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.200
*USER SPECIFIED(SUBAREA):
NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.5080
SUBAREA AREA(ACRES) = 0.79 SUBAREA RUNOFF(CFS) = 4.16
TOTAL AREA(ACRES) = 7.0 TOTAL RUNOFF(CFS) = 22.14
TC(MIN.) = 7.67

*****
FLOW PROCESS FROM NODE 168.00 TO NODE 168.00 IS CODE = 1
-----
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 7.67
RAINFALL INTENSITY(INCH/HR) = 6.20
TOTAL STREAM AREA(ACRES) = 7.03
PEAK FLOW RATE(CFS) AT CONFLUENCE = 22.14

** CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 60.45 13.63 4.277 34.94
2 22.14 7.67 6.200 7.03

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

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 63.84 7.67 6.200
2 75.72 13.63 4.277

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 75.72 Tc(MIN.) = 13.63
TOTAL AREA(ACRES) = 42.0
LONGEST FLOWPATH FROM NODE 154.00 TO NODE 168.00 = 5378.00 FEET.

*****
FLOW PROCESS FROM NODE 168.00 TO NODE 146.00 IS CODE = 31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 887.00 DOWNSTREAM(FEET) = 881.00
FLOW LENGTH(FEET) = 314.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 36.0 INCH PIPE IS 25.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 14.25
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 75.72
PIPE TRAVEL TIME(MIN.) = 0.37 Tc(MIN.) = 14.00
LONGEST FLOWPATH FROM NODE 154.00 TO NODE 146.00 = 5692.00 FEET.

*****
FLOW PROCESS FROM NODE 146.00 TO NODE 146.00 IS CODE = 1
-----
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 14.00
RAINFALL INTENSITY(INCH/HR) = 4.20
TOTAL STREAM AREA(ACRES) = 41.97
PEAK FLOW RATE(CFS) AT CONFLUENCE = 75.72

*****
FLOW PROCESS FROM NODE 177.00 TO NODE 177.00 IS CODE = 21
-----
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 930.00
DOWNSTREAM ELEVATION(FEET) = 920.00
ELEVATION DIFFERENCE(FEET) = 10.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 6.267
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.061
SUBAREA RUNOFF(CFS) = 0.72
TOTAL AREA(ACRES) = 0.29 TOTAL RUNOFF(CFS) = 0.72

*****
FLOW PROCESS FROM NODE 178.00 TO NODE 176.00 IS CODE = 61
-----
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>>(STANDARD CURB SECTION USED)<<<<
=====
UPSTREAM ELEVATION(FEET) = 915.00 DOWNSTREAM ELEVATION(FEET) = 889.00
STREET LENGTH(FEET) = 765.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 22.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 11.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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) = 7.14
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.31
HALFSTREET FLOOD WIDTH(FEET) = 8.96
AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.88
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.18
STREET FLOW TRAVEL TIME(MIN.) = 3.29 Tc(MIN.) = 9.55
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.379
*USER SPECIFIED(SUBAREA):
NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.804
SUBAREA AREA(ACRES) = 2.88 SUBAREA RUNOFF(CFS) = 13.17
TOTAL AREA(ACRES) = 3.2 PEAK FLOW RATE(CFS) = 13.71

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.36 HALFSTREET FLOOD WIDTH(FEET) = 11.82
FLOW VELOCITY(FEET/SEC.) = 4.53 DEPTH*VELOCITY(FT*FT/SEC.) = 1.64
LONGEST FLOWPATH FROM NODE 177.00 TO NODE 176.00 = 865.00 FEET.

*****
FLOW PROCESS FROM NODE 176.00 TO NODE 176.00 IS CODE = 1
-----
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 9.55
RAINFALL INTENSITY(INCH/HR) = 5.38
TOTAL STREAM AREA(ACRES) = 3.17
PEAK FLOW RATE(CFS) AT CONFLUENCE = 13.71

** CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 75.72 14.00 4.204 41.97
2 13.71 9.55 5.379 3.17

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

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 72.89 9.55 5.379
2 86.44 14.00 4.204

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 86.44 Tc(MIN.) = 14.00
TOTAL AREA(ACRES) = 45.1
LONGEST FLOWPATH FROM NODE 154.00 TO NODE 176.00 = 5692.00 FEET.

*****
FLOW PROCESS FROM NODE 176.00 TO NODE 146.00 IS CODE = 11
-----
>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<
=====

** MAIN STREAM CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 86.44 14.00 4.204 45.14
LONGEST FLOWPATH FROM NODE 154.00 TO NODE 146.00 = 5692.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 730.30 28.54 2.655 755.44
LONGEST FLOWPATH FROM NODE 129.00 TO NODE 146.00 = 10782.00 FEET.

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 444.67 14.00 4.204
2 784.90 28.54 2.655

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 784.90 Tc(MIN.) = 28.54
TOTAL AREA(ACRES) = 800.6

```

```

*****
FLOW PROCESS FROM NODE    146.00 TO NODE    146.00 IS CODE =  12
-----
>>>>CLEAR MEMORY BANK # 1 <<<<
=====
+-----+
|                                             |
|                                             |
+-----+

*****
FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 70.00
UPSTREAM ELEVATION(FEET) = 1020.35
DOWNSTREAM ELEVATION(FEET) = 1019.65
ELEVATION DIFFERENCE(FEET) = 0.70
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 9.638
WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
         THE MAXIMUM OVERLAND FLOW LENGTH = 70.00
         (Reference: Table 3-1B of Hydrology Manual)
         THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.349
SUBAREA RUNOFF(CFS) = 1.87
TOTAL AREA(ACRES) = 0.76 TOTAL RUNOFF(CFS) = 1.87

*****
FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  61
-----
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>(STANDARD CURB SECTION USED)<<<<
=====
UPSTREAM ELEVATION(FEET) = 1019.65 DOWNSTREAM ELEVATION(FEET) = 929.00
STREET LENGTH(FEET) = 1536.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 14.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 7.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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) = 8.92
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.30
HALFSTREET FLOOD WIDTH(FEET) = 8.72
AVERAGE FLOW VELOCITY(FT/SEC.) = 5.07
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.53
STREET FLOW TRAVEL TIME(MIN.) = 5.05 Tc(MIN.) = 14.68
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.077
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.460
SUBAREA AREA(ACRES) = 7.43 SUBAREA RUNOFF(CFS) = 13.93
TOTAL AREA(ACRES) = 8.2 PEAK FLOW RATE(CFS) = 15.36

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.35 HALFSTREET FLOOD WIDTH(FEET) = 11.02
FLOW VELOCITY(FT/SEC.) = 5.76 DEPTH*VELOCITY(FT*FT/SEC.) = 2.00
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 202.00 = 1606.00 FEET.

*****
FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 924.00 DOWNSTREAM(FEET) = 921.50
FLOW LENGTH(FEET) = 417.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 24.0 INCH PIPE IS 17.8 INCHES
PIPE-FLOW VELOCITY(FT/SEC.) = 6.15
ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 15.36
PIPE TRAVEL TIME(MIN.) = 1.13 Tc(MIN.) = 15.81
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 203.00 = 2023.00 FEET.

*****
FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =  10
-----
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
=====

*****
FLOW PROCESS FROM NODE    205.00 TO NODE    206.00 IS CODE =  21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 1030.00
DOWNSTREAM ELEVATION(FEET) = 1020.00
ELEVATION DIFFERENCE(FEET) = 10.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 6.267
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.061
SUBAREA RUNOFF(CFS) = 0.89
TOTAL AREA(ACRES) = 0.36 TOTAL RUNOFF(CFS) = 0.89

*****
FLOW PROCESS FROM NODE    206.00 TO NODE    207.00 IS CODE =  31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1020.00 DOWNSTREAM(FEET) = 938.00
FLOW LENGTH(FEET) = 1355.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 2.3 INCHES
PIPE-FLOW VELOCITY(FT/SEC.) = 6.68
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 0.89
PIPE TRAVEL TIME(MIN.) = 3.38 Tc(MIN.) = 9.65
LONGEST FLOWPATH FROM NODE 205.00 TO NODE 207.00 = 1455.00 FEET.

*****
FLOW PROCESS FROM NODE    206.00 TO NODE    207.00 IS CODE =  81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.345
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 11.35 SUBAREA RUNOFF(CFS) = 21.23
TOTAL AREA(ACRES) = 11.7 TOTAL RUNOFF(CFS) = 21.91
Tc(MIN.) = 9.65

*****
FLOW PROCESS FROM NODE    207.00 TO NODE    208.00 IS CODE =  31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 933.00 DOWNSTREAM(FEET) = 922.00
FLOW LENGTH(FEET) = 175.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.8 INCHES
PIPE-FLOW VELOCITY(FT/SEC.) = 16.31
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 21.91
PIPE TRAVEL TIME(MIN.) = 0.18 Tc(MIN.) = 9.83
LONGEST FLOWPATH FROM NODE 205.00 TO NODE 208.00 = 1630.00 FEET.

*****
FLOW PROCESS FROM NODE    208.00 TO NODE    208.00 IS CODE =  1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 9.83
RAINFALL INTENSITY(INCH/HR) = 5.28
TOTAL STREAM AREA(ACRES) = 11.71
PEAK FLOW RATE(CFS) AT CONFLUENCE = 21.91

*****
FLOW PROCESS FROM NODE    210.00 TO NODE    211.00 IS CODE =  21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7900
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 70.00
UPSTREAM ELEVATION(FEET) = 988.00
DOWNSTREAM ELEVATION(FEET) = 987.00
ELEVATION DIFFERENCE(FEET) = 1.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 4.038
WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
         THE MAXIMUM OVERLAND FLOW LENGTH = 66.43
         (Reference: Table 3-1B of Hydrology Manual)
         THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 8.168
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) = 0.97
TOTAL AREA(ACRES) = 0.15 TOTAL RUNOFF(CFS) = 0.97

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*****
FLOW PROCESS FROM NODE    211.00 TO NODE    208.00 IS CODE =  61
-----
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>(STANDARD CURB SECTION USED)<<<<
=====
UPSTREAM ELEVATION(FEET) =  987.00  DOWNSTREAM ELEVATION(FEET) =  927.00
STREET LENGTH(FEET) =  694.00  CURB HEIGHT(INCHES) =  6.0
STREET HALFWIDTH(FEET) =  14.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  7.00
INSIDE STREET CROSSFALL(DECIMAL) =  0.020
OUTSIDE STREET CROSSFALL(DECIMAL) =  0.020

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) =  3.76
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) =  0.23
HALFSTREET FLOOD WIDTH(FEET) =  5.07
AVERAGE FLOW VELOCITY(FEET/SEC.) =  5.02
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =  1.14
STREET FLOW TRAVEL TIME(MIN.) =  2.30  Tc(MIN.) =  6.34
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.007
*USER SPECIFIED(SUBAREA):
NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7900
S.C.S. CURVE NUMBER (AMC II) =  0
AREA-AVERAGE RUNOFF COEFFICIENT =  0.790
SUBAREA AREA(ACRES) =  1.01  SUBAREA RUNOFF(CFS) =  5.59
TOTAL AREA(ACRES) =  1.2  PEAK FLOW RATE(CFS) =  6.42

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.26  HALFSTREET FLOOD WIDTH(FEET) =  6.79
FLOW VELOCITY(FEET/SEC.) =  5.55  DEPTH*VELOCITY(FT*FT/SEC.) =  1.45
LONGEST FLOWPATH FROM NODE    210.00 TO NODE    208.00 =  764.00 FEET.

*****
FLOW PROCESS FROM NODE    208.00 TO NODE    208.00 IS CODE =  1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
TIME OF CONCENTRATION(MIN.) =  6.34
RAINFALL INTENSITY(INCH/HR) =  7.01
TOTAL STREAM AREA(ACRES) =  1.16
PEAK FLOW RATE(CFS) AT CONFLUENCE =  6.42

** CONFLUENCE DATA **
STREAM  RUNOFF      Tc      INTENSITY      AREA
NUMBER  (CFS)      (MIN.)  (INCH/HOUR)  (ACRE)
  1      21.91      9.83      5.283      11.71
  2       6.42      6.34      7.007       1.16

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

** PEAK FLOW RATE TABLE **
STREAM  RUNOFF      Tc      INTENSITY
NUMBER  (CFS)      (MIN.)  (INCH/HOUR)
  1      20.56      6.34      7.007
  2      26.75      9.83      5.283

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =  26.75  Tc(MIN.) =  9.83
TOTAL AREA(ACRES) =  12.9
LONGEST FLOWPATH FROM NODE    205.00 TO NODE    208.00 =  1630.00 FEET.

*****
FLOW PROCESS FROM NODE    208.00 TO NODE    203.00 IS CODE =  31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =  922.00  DOWNSTREAM(FEET) =  921.00
FLOW LENGTH(FEET) =  40.00  MANNING'S N =  0.013
DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =  12.23
ESTIMATED PIPE DIAMETER(INCH) =  24.00  NUMBER OF PIPES =  1
PIPE-FLOW(CFS) =  26.75
PIPE TRAVEL TIME(MIN.) =  0.05  Tc(MIN.) =  9.88
LONGEST FLOWPATH FROM NODE    205.00 TO NODE    203.00 =  1670.00 FEET.

*****
FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =  11
-----
>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<
=====

** MAIN STREAM CONFLUENCE DATA **
STREAM  RUNOFF      Tc      INTENSITY      AREA

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NUMBER      (CFS)      (MIN.)  (INCH/HOUR)  (ACRE)
  1      26.75      9.88      5.264      12.87
LONGEST FLOWPATH FROM NODE    205.00 TO NODE    203.00 =  1670.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **
STREAM  RUNOFF      Tc      INTENSITY      AREA
NUMBER  (CFS)      (MIN.)  (INCH/HOUR)  (ACRE)
  1      15.36      15.81      3.886      8.19
LONGEST FLOWPATH FROM NODE    200.00 TO NODE    203.00 =  2023.00 FEET.

** PEAK FLOW RATE TABLE **
STREAM  RUNOFF      Tc      INTENSITY
NUMBER  (CFS)      (MIN.)  (INCH/HOUR)
  1      36.34      9.88      5.264
  2      35.11      15.81      3.886

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =  36.34  Tc(MIN.) =  9.88
TOTAL AREA(ACRES) =  21.1

*****
FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =  12
-----
>>>>CLEAR MEMORY BANK # 1 <<<<
=====

*****
FLOW PROCESS FROM NODE    203.00 TO NODE    212.00 IS CODE =  31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =  921.00  DOWNSTREAM(FEET) =  915.50
FLOW LENGTH(FEET) =  625.00  MANNING'S N =  0.013
DEPTH OF FLOW IN  30.0 INCH PIPE IS  23.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =  8.70
ESTIMATED PIPE DIAMETER(INCH) =  30.00  NUMBER OF PIPES =  1
PIPE-FLOW(CFS) =  36.34
PIPE TRAVEL TIME(MIN.) =  1.20  Tc(MIN.) =  11.08
LONGEST FLOWPATH FROM NODE    200.00 TO NODE    212.00 =  2648.00 FEET.

*****
FLOW PROCESS FROM NODE    212.00 TO NODE    212.00 IS CODE =  1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
=====
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
TIME OF CONCENTRATION(MIN.) =  11.08
RAINFALL INTENSITY(INCH/HR) =  4.89
TOTAL STREAM AREA(ACRES) =  21.06
PEAK FLOW RATE(CFS) AT CONFLUENCE =  36.34

*****
FLOW PROCESS FROM NODE    214.00 TO NODE    215.00 IS CODE =  21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
S.C.S. CURVE NUMBER (AMC II) =  0
INITIAL SUBAREA FLOW-LENGTH(FEET) =  70.00
UPSTREAM ELEVATION(FEET) =  932.35
DOWNSTREAM ELEVATION(FEET) =  931.65
ELEVATION DIFFERENCE(FEET) =  0.70
SUBAREA OVERLAND TIME OF FLOW(MIN.) =  9.638
WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
THE MAXIMUM OVERLAND FLOW LENGTH =  70.00
(Reference: Table 3-1B of Hydrology Manual)
THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.349
SUBAREA RUNOFF(CFS) =  0.79
TOTAL AREA(ACRES) =  0.32  TOTAL RUNOFF(CFS) =  0.79

*****
FLOW PROCESS FROM NODE    215.00 TO NODE    212.00 IS CODE =  61
-----
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>(STANDARD CURB SECTION USED)<<<<
=====
UPSTREAM ELEVATION(FEET) =  931.00  DOWNSTREAM ELEVATION(FEET) =  921.00
STREET LENGTH(FEET) =  1018.00  CURB HEIGHT(INCHES) =  6.0
STREET HALFWIDTH(FEET) =  14.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  7.00
INSIDE STREET CROSSFALL(DECIMAL) =  0.020
OUTSIDE STREET CROSSFALL(DECIMAL) =  0.020

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) =  6.73
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

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STREET FLOW DEPTH(Feet) = 0.35
HALFSTREET FLOOD WIDTH(Feet) = 11.35
AVERAGE FLOW VELOCITY(Feet/Sec.) = 2.39
PRODUCT OF DEPTH&VELOCITY(Ft*Ft/Sec.) = 0.85
STREET FLOW TRAVEL TIME(Min.) = 7.09 Tc(Min.) = 16.72
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.749
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.460
SUBAREA AREA(ACRES) = 6.77 SUBAREA RUNOFF(CFS) = 11.67
TOTAL AREA(ACRES) = 7.1 PEAK FLOW RATE(CFS) = 12.23

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(Feet) = 0.41 HALFSTREET FLOOD WIDTH(Feet) = 14.00
FLOW VELOCITY(Feet/Sec.) = 2.79 DEPTH*VELOCITY(Ft*Ft/Sec.) = 1.16
LONGEST FLOWPATH FROM NODE 214.00 TO NODE 212.00 = 1088.00 FEET.

*****
FLOW PROCESS FROM NODE 212.00 TO NODE 212.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 16.72
RAINFALL INTENSITY(INCH/HR) = 3.75
TOTAL STREAM AREA(ACRES) = 7.09
PEAK FLOW RATE(CFS) AT CONFLUENCE = 12.23

** CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 36.34 11.08 4.890 21.06
2 12.23 16.72 3.749 7.09

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

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 44.44 11.08 4.890
2 40.09 16.72 3.749

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 44.44 Tc(MIN.) = 11.08
TOTAL AREA(ACRES) = 28.1
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 212.00 = 2648.00 FEET.

*****
FLOW PROCESS FROM NODE 212.00 TO NODE 216.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(Feet) = 915.50 DOWNSTREAM(Feet) = 905.00
FLOW LENGTH(Feet) = 530.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 30.0 INCH PIPE IS 20.1 INCHES
PIPE-FLOW VELOCITY(Feet/Sec.) = 12.71
ESTIMATED PIPE DIAMETER(INCH) = 30.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 44.44
PIPE TRAVEL TIME(MIN.) = 0.70 Tc(MIN.) = 11.77
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 216.00 = 3178.00 FEET.

*****
FLOW PROCESS FROM NODE 216.00 TO NODE 216.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 11.77
RAINFALL INTENSITY(INCH/HR) = 4.70
TOTAL STREAM AREA(ACRES) = 28.15
PEAK FLOW RATE(CFS) AT CONFLUENCE = 44.44

*****
FLOW PROCESS FROM NODE 218.00 TO NODE 219.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(Feet) = 100.00
UPSTREAM ELEVATION(Feet) = 950.00
DOWNSTREAM ELEVATION(Feet) = 940.00
ELEVATION DIFFERENCE(Feet) = 10.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 5.348
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.821
SUBAREA RUNOFF(CFS) = 1.12
TOTAL AREA(ACRES) = 0.31 TOTAL RUNOFF(CFS) = 1.12

*****
FLOW PROCESS FROM NODE 219.00 TO NODE 216.00 IS CODE = 61
-----
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>(STANDARD CURB SECTION USED)<<<<
=====
UPSTREAM ELEVATION(Feet) = 940.00 DOWNSTREAM ELEVATION(Feet) = 910.00
STREET LENGTH(Feet) = 544.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(Feet) = 14.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(Feet) = 7.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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) = 6.75
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(Feet) = 0.28
HALFSTREET FLOOD WIDTH(Feet) = 7.79
AVERAGE FLOW VELOCITY(Feet/Sec.) = 4.65
PRODUCT OF DEPTH&VELOCITY(Ft*Ft/Sec.) = 1.31
STREET FLOW TRAVEL TIME(MIN.) = 1.95 Tc(MIN.) = 7.30
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.400
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.460
SUBAREA AREA(ACRES) = 3.80 SUBAREA RUNOFF(CFS) = 11.19
TOTAL AREA(ACRES) = 4.1 PEAK FLOW RATE(CFS) = 12.10

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(Feet) = 0.33 HALFSTREET FLOOD WIDTH(Feet) = 10.09
FLOW VELOCITY(Feet/Sec.) = 5.32 DEPTH*VELOCITY(Ft*Ft/Sec.) = 1.75
LONGEST FLOWPATH FROM NODE 218.00 TO NODE 216.00 = 644.00 FEET.

*****
FLOW PROCESS FROM NODE 216.00 TO NODE 216.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 7.30
RAINFALL INTENSITY(INCH/HR) = 6.40
TOTAL STREAM AREA(ACRES) = 4.11
PEAK FLOW RATE(CFS) AT CONFLUENCE = 12.10

** CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 44.44 11.77 4.701 28.15
2 12.10 7.30 6.400 4.11

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

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 44.75 7.30 6.400
2 53.33 11.77 4.701

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 53.33 Tc(MIN.) = 11.77
TOTAL AREA(ACRES) = 32.3
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 216.00 = 3178.00 FEET.

*****
FLOW PROCESS FROM NODE 216.00 TO NODE 220.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(Feet) = 905.00 DOWNSTREAM(Feet) = 904.40
FLOW LENGTH(Feet) = 36.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 33.0 INCH PIPE IS 22.4 INCHES
PIPE-FLOW VELOCITY(Feet/Sec.) = 12.45
ESTIMATED PIPE DIAMETER(INCH) = 33.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 53.33
PIPE TRAVEL TIME(MIN.) = 0.05 Tc(MIN.) = 11.82
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 220.00 = 3214.00 FEET.

*****
FLOW PROCESS FROM NODE 220.00 TO NODE 220.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

```

```

TIME OF CONCENTRATION(MIN.) = 11.82
RAINFALL INTENSITY(INCH/HR) = 4.69
TOTAL STREAM AREA(ACRES) = 32.26
PEAK FLOW RATE(CFS) AT CONFLUENCE = 53.33

*****
FLOW PROCESS FROM NODE 222.00 TO NODE 223.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
-----
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 992.00
DOWNSTREAM ELEVATION(FEET) = 982.00
ELEVATION DIFFERENCE(FEET) = 10.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 6.267
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.061
SUBAREA RUNOFF(CFS) = 0.72
TOTAL AREA(ACRES) = 0.29 TOTAL RUNOFF(CFS) = 0.72

*****
FLOW PROCESS FROM NODE 223.00 TO NODE 224.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 982.00 DOWNSTREAM(FEET) = 925.00
FLOW LENGTH(FEET) = 1437.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 2.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.43
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 0.72
PIPE TRAVEL TIME(MIN.) = 4.41 Tc(MIN.) = 10.68
LONGEST FLOWPATH FROM NODE 222.00 TO NODE 224.00 = 1537.00 FEET.

*****
FLOW PROCESS FROM NODE 223.00 TO NODE 224.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.006
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 7.30 SUBAREA RUNOFF(CFS) = 12.79
TOTAL AREA(ACRES) = 7.6 TOTAL RUNOFF(CFS) = 13.30
Tc(MIN.) = 10.68

*****
FLOW PROCESS FROM NODE 224.00 TO NODE 220.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 920.00 DOWNSTREAM(FEET) = 904.40
FLOW LENGTH(FEET) = 218.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 8.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 15.39
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 13.30
PIPE TRAVEL TIME(MIN.) = 0.24 Tc(MIN.) = 10.92
LONGEST FLOWPATH FROM NODE 222.00 TO NODE 220.00 = 1755.00 FEET.

*****
FLOW PROCESS FROM NODE 220.00 TO NODE 220.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
-----
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 10.92
RAINFALL INTENSITY(INCH/HR) = 4.94
TOTAL STREAM AREA(ACRES) = 7.59
PEAK FLOW RATE(CFS) AT CONFLUENCE = 13.30

** CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 53.33 11.82 4.689 32.26
2 13.30 10.92 4.936 7.59

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

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 63.96 10.92 4.936

2 65.96 11.82 4.689

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 65.96 Tc(MIN.) = 11.82
TOTAL AREA(ACRES) = 39.8
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 220.00 = 3214.00 FEET.

*****
FLOW PROCESS FROM NODE 220.00 TO NODE 225.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 904.40 DOWNSTREAM(FEET) = 884.00
FLOW LENGTH(FEET) = 485.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 30.0 INCH PIPE IS 20.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 18.58
ESTIMATED PIPE DIAMETER(INCH) = 30.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 65.96
PIPE TRAVEL TIME(MIN.) = 0.44 Tc(MIN.) = 12.26
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 225.00 = 3699.00 FEET.

*****
FLOW PROCESS FROM NODE 225.00 TO NODE 225.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
-----
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 12.26
RAINFALL INTENSITY(INCH/HR) = 4.58
TOTAL STREAM AREA(ACRES) = 39.85
PEAK FLOW RATE(CFS) AT CONFLUENCE = 65.96

*****
FLOW PROCESS FROM NODE 227.00 TO NODE 228.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
-----
*USER SPECIFIED(SUBAREA):
NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7900
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 950.00
DOWNSTREAM ELEVATION(FEET) = 940.00
ELEVATION DIFFERENCE(FEET) = 10.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 2.590
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 8.168
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) = 2.00
TOTAL AREA(ACRES) = 0.31 TOTAL RUNOFF(CFS) = 2.00

*****
FLOW PROCESS FROM NODE 228.00 TO NODE 225.00 IS CODE = 61
-----
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>(STANDARD CURB SECTION USED)<<<<
-----
UPSTREAM ELEVATION(FEET) = 940.00 DOWNSTREAM ELEVATION(FEET) = 889.00
STREET LENGTH(FEET) = 942.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 14.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 7.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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) = 11.79
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.33
HALFSTREET FLOOD WIDTH(FEET) = 10.04
AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.24
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.71
STREET FLOW TRAVEL TIME(MIN.) = 3.00 Tc(MIN.) = 5.59
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.602
*USER SPECIFIED(SUBAREA):
NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7900
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.790
SUBAREA AREA(ACRES) = 3.24 SUBAREA RUNOFF(CFS) = 19.46
TOTAL AREA(ACRES) = 3.5 PEAK FLOW RATE(CFS) = 21.32

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.38 HALFSTREET FLOOD WIDTH(FEET) = 12.88
FLOW VELOCITY(FEET/SEC.) = 6.00 DEPTH*VELOCITY(FT*FT/SEC.) = 2.30
LONGEST FLOWPATH FROM NODE 227.00 TO NODE 225.00 = 1042.00 FEET.

*****
FLOW PROCESS FROM NODE 228.00 TO NODE 225.00 IS CODE = 81
-----
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>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.602
*USER SPECIFIED(SUBAREA):
LAWNS, GOLF COURSES, ETC. GOOD COVER RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.6668
SUBAREA AREA(ACRES) = 1.38 SUBAREA RUNOFF(CFS) = 3.67
TOTAL AREA(ACRES) = 4.9 TOTAL RUNOFF(CFS) = 24.99
TC(MIN.) = 5.59

*****
FLOW PROCESS FROM NODE 225.00 TO NODE 225.00 IS CODE = 1
-----
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 5.59
RAINFALL INTENSITY(INCH/HR) = 7.60
TOTAL STREAM AREA(ACRES) = 4.93
PEAK FLOW RATE(CFS) AT CONFLUENCE = 24.99

** CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 65.96 12.26 4.581 39.85
2 24.99 5.59 7.602 4.93

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

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 64.74 5.59 7.602
2 81.02 12.26 4.581

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 81.02 Tc(MIN.) = 12.26
TOTAL AREA(ACRES) = 44.8
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 225.00 = 3699.00 FEET.

*****
FLOW PROCESS FROM NODE 225.00 TO NODE 229.00 IS CODE = 31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 882.00 DOWNSTREAM(FEET) = 881.00
FLOW LENGTH(FEET) = 102.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 10.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.07
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 6.40
PIPE TRAVEL TIME(MIN.) = 0.28 Tc(MIN.) = 15.63
LONGEST FLOWPATH FROM NODE 231.00 TO NODE 234.00 = 1005.00 FEET.

*****
FLOW PROCESS FROM NODE 234.00 TO NODE 234.00 IS CODE = 1
-----
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 15.63
RAINFALL INTENSITY(INCH/HR) = 3.92
TOTAL STREAM AREA(ACRES) = 3.51
PEAK FLOW RATE(CFS) AT CONFLUENCE = 6.40

*****
FLOW PROCESS FROM NODE 235.00 TO NODE 236.00 IS CODE = 21
-----
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=====
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 65.00
UPSTREAM ELEVATION(FEET) = 913.65
DOWNSTREAM ELEVATION(FEET) = 913.00
ELEVATION DIFFERENCE(FEET) = 0.65
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 9.288
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.478
SUBAREA RUNOFF(CFS) = 1.03
TOTAL AREA(ACRES) = 0.41 TOTAL RUNOFF(CFS) = 1.03

*****
FLOW PROCESS FROM NODE 236.00 TO NODE 237.00 IS CODE = 61
-----
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STANDARD CURB SECTION USED)<<<<<
=====
UPSTREAM ELEVATION(FEET) = 913.00 DOWNSTREAM ELEVATION(FEET) = 898.00
STREET LENGTH(FEET) = 1269.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 14.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 7.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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) = 7.19
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.35
HALFSTREET FLOOD WIDTH(FEET) = 11.24
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.60
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.91

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STREET FLOW TRAVEL TIME(MIN.) = 8.13 Tc(MIN.) = 17.42
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.652
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.460
SUBAREA AREA(ACRES) = 7.15 SUBAREA RUNOFF(CFS) = 12.01
TOTAL AREA(ACRES) = 7.6 PEAK FLOW RATE(CFS) = 12.70

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.41 HALFSTREET FLOOD WIDTH(FEET) = 14.00
FLOW VELOCITY(FEET/SEC.) = 2.99 DEPTH*VELOCITY(FT*FT/SEC.) = 1.23
LONGEST FLOWPATH FROM NODE 235.00 TO NODE 237.00 = 1334.00 FEET.

*****
FLOW PROCESS FROM NODE 237.00 TO NODE 234.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 883.00 DOWNSTREAM(FEET) = 881.00
FLOW LENGTH(FEET) = 111.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 13.7 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 8.83
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 12.70
PIPE TRAVEL TIME(MIN.) = 0.21 Tc(MIN.) = 17.63
LONGEST FLOWPATH FROM NODE 235.00 TO NODE 234.00 = 1445.00 FEET.

*****
FLOW PROCESS FROM NODE 234.00 TO NODE 234.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 17.63
RAINFALL INTENSITY(INCH/HR) = 3.62
TOTAL STREAM AREA(ACRES) = 7.56
PEAK FLOW RATE(CFS) AT CONFLUENCE = 12.70

** CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 6.40 15.63 3.917 3.51
2 12.70 17.63 3.624 7.56

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

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 17.66 15.63 3.917
2 18.62 17.63 3.624

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 18.62 Tc(MIN.) = 17.63
TOTAL AREA(ACRES) = 11.1
LONGEST FLOWPATH FROM NODE 235.00 TO NODE 234.00 = 1445.00 FEET.

*****
FLOW PROCESS FROM NODE 234.00 TO NODE 229.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 881.00 DOWNSTREAM(FEET) = 880.00
FLOW LENGTH(FEET) = 160.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 27.0 INCH PIPE IS 17.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.64
ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 18.62
PIPE TRAVEL TIME(MIN.) = 0.40 Tc(MIN.) = 18.03
LONGEST FLOWPATH FROM NODE 235.00 TO NODE 229.00 = 1605.00 FEET.

*****
FLOW PROCESS FROM NODE 229.00 TO NODE 229.00 IS CODE = 11
-----
>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<
=====

** MAIN STREAM CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 18.62 18.03 3.571 11.07
LONGEST FLOWPATH FROM NODE 235.00 TO NODE 229.00 = 1605.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 81.02 12.36 4.555 44.78
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 229.00 = 3779.00 FEET.

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 93.79 12.36 4.555
2 82.15 18.03 3.571

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 93.79 Tc(MIN.) = 12.36
TOTAL AREA(ACRES) = 55.8

*****
FLOW PROCESS FROM NODE 229.00 TO NODE 229.00 IS CODE = 12
-----
>>>>CLEAR MEMORY BANK # 1 <<<<
=====

*****
FLOW PROCESS FROM NODE 229.00 TO NODE 240.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 885.00 DOWNSTREAM(FEET) = 880.00
FLOW LENGTH(FEET) = 51.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 27.0 INCH PIPE IS 21.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 27.10
ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 93.79
PIPE TRAVEL TIME(MIN.) = 0.03 Tc(MIN.) = 12.40
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 240.00 = 3830.00 FEET.

*****
FLOW PROCESS FROM NODE 240.00 TO NODE 243.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 880.00 DOWNSTREAM(FEET) = 878.00
FLOW LENGTH(FEET) = 170.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 42.0 INCH PIPE IS 30.6 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 12.48
ESTIMATED PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 93.79
PIPE TRAVEL TIME(MIN.) = 0.23 Tc(MIN.) = 12.62
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 243.00 = 4000.00 FEET.

*****
FLOW PROCESS FROM NODE 243.00 TO NODE 243.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 12.62
RAINFALL INTENSITY(INCH/HR) = 4.49
TOTAL STREAM AREA(ACRES) = 55.85
PEAK FLOW RATE(CFS) AT CONFLUENCE = 93.79

*****
FLOW PROCESS FROM NODE 241.00 TO NODE 242.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 70.00
UPSTREAM ELEVATION(FEET) = 885.00
DOWNSTREAM ELEVATION(FEET) = 880.00
ELEVATION DIFFERENCE(FEET) = 5.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 5.865
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.369
SUBAREA RUNOFF(CFS) = 0.34
TOTAL AREA(ACRES) = 0.13 TOTAL RUNOFF(CFS) = 0.34

*****
FLOW PROCESS FROM NODE 242.00 TO NODE 243.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 880.00 DOWNSTREAM(FEET) = 878.00
FLOW LENGTH(FEET) = 198.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 2.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 2.69
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 0.34
PIPE TRAVEL TIME(MIN.) = 1.22 Tc(MIN.) = 7.09
LONGEST FLOWPATH FROM NODE 241.00 TO NODE 243.00 = 268.00 FEET.

*****
FLOW PROCESS FROM NODE 242.00 TO NODE 243.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<

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=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.520
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 1.30 SUBAREA RUNOFF(CFS) = 2.97
TOTAL AREA(ACRES) = 1.4 TOTAL RUNOFF(CFS) = 3.26
TC(MIN.) = 7.09

*****
FLOW PROCESS FROM NODE 243.00 TO NODE 243.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 7.09
RAINFALL INTENSITY(INCH/HR) = 6.52
TOTAL STREAM AREA(ACRES) = 1.43
PEAK FLOW RATE(CFS) AT CONFLUENCE = 3.26

** CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 93.79 12.62 4.494 55.85
2 3.26 7.09 6.520 1.43

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

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 55.94 7.09 6.520
2 3.26 12.62 4.494

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 96.04 Tc(MIN.) = 12.62
TOTAL AREA(ACRES) = 57.3
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 243.00 = 4000.00 FEET.

*****
FLOW PROCESS FROM NODE 243.00 TO NODE 247.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 880.00 DOWNSTREAM(FEET) = 878.00
FLOW LENGTH(FEET) = 330.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 48.0 INCH PIPE IS 35.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 9.79
ESTIMATED PIPE DIAMETER(INCH) = 48.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 96.04
PIPE TRAVEL TIME(MIN.) = 0.56 Tc(MIN.) = 13.19
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 247.00 = 4330.00 FEET.

*****
FLOW PROCESS FROM NODE 247.00 TO NODE 247.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 13.19
RAINFALL INTENSITY(INCH/HR) = 4.37
TOTAL STREAM AREA(ACRES) = 57.28
PEAK FLOW RATE(CFS) AT CONFLUENCE = 96.04

*****
FLOW PROCESS FROM NODE 245.00 TO NODE 246.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7900
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 70.00
UPSTREAM ELEVATION(FEET) = 914.00
DOWNSTREAM ELEVATION(FEET) = 912.00
ELEVATION DIFFERENCE(FEET) = 2.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 3.290
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 8.168
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) = 0.97
TOTAL AREA(ACRES) = 0.15 TOTAL RUNOFF(CFS) = 0.97

*****
FLOW PROCESS FROM NODE 246.00 TO NODE 247.00 IS CODE = 61
-----
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>(STANDARD CURB SECTION USED)<<<<
=====
UPSTREAM ELEVATION(FEET) = 912.00 DOWNSTREAM ELEVATION(FEET) = 883.00

STREET LENGTH(FEET) = 879.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 14.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 7.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.04
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.28
HALFSTREET FLOOD WIDTH(FEET) = 7.68
AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.56
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.00
STREET FLOW TRAVEL TIME(MIN.) = 4.12 Tc(MIN.) = 7.41
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.338
*USER SPECIFIED(SUBAREA):
NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7900
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.790
SUBAREA AREA(ACRES) = 1.60 SUBAREA RUNOFF(CFS) = 8.01
TOTAL AREA(ACRES) = 1.8 PEAK FLOW RATE(CFS) = 8.76

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.32 HALFSTREET FLOOD WIDTH(FEET) = 9.82
FLOW VELOCITY(FEET/SEC.) = 4.05 DEPTH*VELOCITY(FT*FT/SEC.) = 1.31
LONGEST FLOWPATH FROM NODE 245.00 TO NODE 247.00 = 949.00 FEET.

*****
FLOW PROCESS FROM NODE 247.00 TO NODE 247.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 7.41
RAINFALL INTENSITY(INCH/HR) = 6.34
TOTAL STREAM AREA(ACRES) = 1.75
PEAK FLOW RATE(CFS) AT CONFLUENCE = 8.76

** CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 96.04 13.19 4.370 57.28
2 8.76 7.41 6.338 1.75

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

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 74.99 7.41 6.338
2 102.09 13.19 4.370

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 102.09 Tc(MIN.) = 13.19
TOTAL AREA(ACRES) = 59.0
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 247.00 = 4330.00 FEET.

*****
FLOW PROCESS FROM NODE 247.00 TO NODE 248.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 878.00 DOWNSTREAM(FEET) = 877.00
FLOW LENGTH(FEET) = 124.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 45.0 INCH PIPE IS 35.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 10.92
ESTIMATED PIPE DIAMETER(INCH) = 45.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 102.09
PIPE TRAVEL TIME(MIN.) = 0.19 Tc(MIN.) = 13.37
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 248.00 = 4454.00 FEET.

*****
FLOW PROCESS FROM NODE 248.00 TO NODE 248.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 13.37
RAINFALL INTENSITY(INCH/HR) = 4.33
TOTAL STREAM AREA(ACRES) = 59.03
PEAK FLOW RATE(CFS) AT CONFLUENCE = 102.09

*****
FLOW PROCESS FROM NODE 250.00 TO NODE 251.00 IS CODE = 21
-----

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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 960.00
DOWNSTREAM ELEVATION(FEET) = 950.00
ELEVATION DIFFERENCE(FEET) = 10.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 6.267
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.061
SUBAREA RUNOFF(CFS) = 0.20
TOTAL AREA(ACRES) = 0.08 TOTAL RUNOFF(CFS) = 0.20

*****
FLOW PROCESS FROM NODE 251.00 TO NODE 252.00 IS CODE = 53
-----
>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 950.00 DOWNSTREAM(FEET) = 885.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 752.00 CHANNEL SLOPE = 0.0864
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 0.20
FLOW VELOCITY(FEET/SEC) = 1.65 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 7.61 Tc(MIN.) = 13.88
LONGEST FLOWPATH FROM NODE 250.00 TO NODE 252.00 = 852.00 FEET.

*****
FLOW PROCESS FROM NODE 251.00 TO NODE 252.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.228
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 8.70 SUBAREA RUNOFF(CFS) = 12.87
TOTAL AREA(ACRES) = 8.8 TOTAL RUNOFF(CFS) = 12.99
Tc(MIN.) = 13.88

*****
FLOW PROCESS FROM NODE 252.00 TO NODE 248.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 885.00 DOWNSTREAM(FEET) = 880.00
FLOW LENGTH(FEET) = 50.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 7.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 17.32
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 12.99
PIPE TRAVEL TIME(MIN.) = 0.05 Tc(MIN.) = 13.93
LONGEST FLOWPATH FROM NODE 250.00 TO NODE 248.00 = 902.00 FEET.

*****
FLOW PROCESS FROM NODE 248.00 TO NODE 248.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 13.93
RAINFALL INTENSITY(INCH/HR) = 4.22
TOTAL STREAM AREA(ACRES) = 8.78
PEAK FLOW RATE(CFS) AT CONFLUENCE = 12.99

** CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 102.09 13.37 4.330 59.03
2 12.99 13.93 4.218 8.78

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

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 114.56 13.37 4.330
2 112.44 13.93 4.218

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 114.56 Tc(MIN.) = 13.37
TOTAL AREA(ACRES) = 67.8
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 248.00 = 4454.00 FEET.
+-----+
| |
+-----+

|-----|
FLOW PROCESS FROM NODE 255.00 TO NODE 256.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
CHAPARRAL(BROADLEAF) GOOD COVER RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 960.00
DOWNSTREAM ELEVATION(FEET) = 955.00
ELEVATION DIFFERENCE(FEET) = 5.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 7.895
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.083
SUBAREA RUNOFF(CFS) = 0.64
TOTAL AREA(ACRES) = 0.30 TOTAL RUNOFF(CFS) = 0.64

*****
FLOW PROCESS FROM NODE 256.00 TO NODE 257.00 IS CODE = 53
-----
>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 955.00 DOWNSTREAM(FEET) = 911.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 741.00 CHANNEL SLOPE = 0.0594
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 0.64
FLOW VELOCITY(FEET/SEC) = 1.36 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 9.05 Tc(MIN.) = 16.95
LONGEST FLOWPATH FROM NODE 255.00 TO NODE 257.00 = 841.00 FEET.

*****
FLOW PROCESS FROM NODE 256.00 TO NODE 257.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.717
*USER SPECIFIED(SUBAREA):
DESERT SHRUB GOOD COVER RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 13.54 SUBAREA RUNOFF(CFS) = 17.61
TOTAL AREA(ACRES) = 13.8 TOTAL RUNOFF(CFS) = 18.01
Tc(MIN.) = 16.95

+-----+
| |
+-----+

*****
FLOW PROCESS FROM NODE 260.00 TO NODE 261.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
DESERT SHRUB GOOD COVER RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 1430.00
DOWNSTREAM ELEVATION(FEET) = 1420.00
ELEVATION DIFFERENCE(FEET) = 10.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 6.267
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.061
SUBAREA RUNOFF(CFS) = 0.54
TOTAL AREA(ACRES) = 0.22 TOTAL RUNOFF(CFS) = 0.54

*****
FLOW PROCESS FROM NODE 261.00 TO NODE 262.00 IS CODE = 52
-----
>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1420.00 DOWNSTREAM(FEET) = 890.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 4480.00 CHANNEL SLOPE = 0.1183
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 0.54
FLOW VELOCITY(FEET/SEC) = 4.74 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 15.74 Tc(MIN.) = 22.01
LONGEST FLOWPATH FROM NODE 260.00 TO NODE 262.00 = 4580.00 FEET.

*****
FLOW PROCESS FROM NODE 261.00 TO NODE 262.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.140
*USER SPECIFIED(SUBAREA):
DESERT SHRUB GOOD COVER RUNOFF COEFFICIENT = .3500

```

S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 180.52 SUBAREA RUNOFF(CFS) = 198.41
TOTAL AREA(ACRES) = 180.7 TOTAL RUNOFF(CFS) = 198.65
TC(MIN.) = 22.01

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|
|

FLOW PROCESS FROM NODE 265.00 TO NODE 266.00 IS CODE = 21

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

*USER SPECIFIED(SUBAREA):
DESERT SHRUB GOOD COVER RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 988.00
DOWNSTREAM ELEVATION(FEET) = 980.00
ELEVATION DIFFERENCE(FEET) = 8.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 6.750
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.730
SUBAREA RUNOFF(CFS) = 0.92
TOTAL AREA(ACRES) = 0.39 TOTAL RUNOFF(CFS) = 0.92

FLOW PROCESS FROM NODE 266.00 TO NODE 267.00 IS CODE = 52

>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<

ELEVATION DATA: UPSTREAM(FEET) = 980.00 DOWNSTREAM(FEET) = 900.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1124.00 CHANNEL SLOPE = 0.0712
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 0.92
FLOW VELOCITY(FEET/SEC) = 4.00 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 4.68 Tc(MIN.) = 11.43
LONGEST FLOWPATH FROM NODE 265.00 TO NODE 267.00 = 1224.00 FEET.

FLOW PROCESS FROM NODE 266.00 TO NODE 267.00 IS CODE = 81

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

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.791
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .4000
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3984
SUBAREA AREA(ACRES) = 11.84 SUBAREA RUNOFF(CFS) = 22.69
TOTAL AREA(ACRES) = 12.2 TOTAL RUNOFF(CFS) = 23.35
TC(MIN.) = 11.43

FLOW PROCESS FROM NODE 267.00 TO NODE 268.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 895.00 DOWNSTREAM(FEET) = 890.00
FLOW LENGTH(FEET) = 674.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 27.0 INCH PIPE IS 20.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 7.40
ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 23.35
PIPE TRAVEL TIME(MIN.) = 1.52 Tc(MIN.) = 12.95
LONGEST FLOWPATH FROM NODE 265.00 TO NODE 268.00 = 1898.00 FEET.

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FLOW PROCESS FROM NODE 270.00 TO NODE 271.00 IS CODE = 21

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

*USER SPECIFIED(SUBAREA):
NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7900
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 70.00
UPSTREAM ELEVATION(FEET) = 1315.50
DOWNSTREAM ELEVATION(FEET) = 1315.00
ELEVATION DIFFERENCE(FEET) = 0.50
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 4.599
WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
THE MAXIMUM OVERLAND FLOW LENGTH = 54.29
(Reference: Table 3-1B of Hydrology Manual)
THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 8.168
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) = 0.45
TOTAL AREA(ACRES) = 0.07 TOTAL RUNOFF(CFS) = 0.45

FLOW PROCESS FROM NODE 271.00 TO NODE 272.00 IS CODE = 61

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>(STANDARD CURB SECTION USED)<<<<

UPSTREAM ELEVATION(FEET) = 1315.50 DOWNSTREAM ELEVATION(FEET) = 1308.00
STREET LENGTH(FEET) = 833.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 14.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 7.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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) = 2.66
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.28
HALFSTREET FLOOD WIDTH(FEET) = 7.68
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.88
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.53
STREET FLOW TRAVEL TIME(MIN.) = 7.40 Tc(MIN.) = 12.00
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.644
*USER SPECIFIED(SUBAREA):
NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7900
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.790
SUBAREA AREA(ACRES) = 1.16 SUBAREA RUNOFF(CFS) = 4.26
TOTAL AREA(ACRES) = 1.2 PEAK FLOW RATE(CFS) = 4.51

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.32 HALFSTREET FLOOD WIDTH(FEET) = 9.76
FLOW VELOCITY(FEET/SEC.) = 2.11 DEPTH*VELOCITY(FT*FT/SEC.) = 0.68
LONGEST FLOWPATH FROM NODE 270.00 TO NODE 272.00 = 903.00 FEET.

FLOW PROCESS FROM NODE 272.00 TO NODE 277.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 1303.00 DOWNSTREAM(FEET) = 1205.00
FLOW LENGTH(FEET) = 1000.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 4.6 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 12.81
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 4.51
PIPE TRAVEL TIME(MIN.) = 1.30 Tc(MIN.) = 13.30
LONGEST FLOWPATH FROM NODE 270.00 TO NODE 277.00 = 1903.00 FEET.

FLOW PROCESS FROM NODE 277.00 TO NODE 277.00 IS CODE = 1

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

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 13.30
RAINFALL INTENSITY(INCH/HR) = 4.35
TOTAL STREAM AREA(ACRES) = 1.23
PEAK FLOW RATE(CFS) AT CONFLUENCE = 4.51

FLOW PROCESS FROM NODE 274.00 TO NODE 275.00 IS CODE = 21

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

*USER SPECIFIED(SUBAREA):
NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7900
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 70.00
UPSTREAM ELEVATION(FEET) = 1343.50
DOWNSTREAM ELEVATION(FEET) = 1343.00
ELEVATION DIFFERENCE(FEET) = 0.50
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 4.599
WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
THE MAXIMUM OVERLAND FLOW LENGTH = 54.29
(Reference: Table 3-1B of Hydrology Manual)
THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 8.168
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) = 1.03
TOTAL AREA(ACRES) = 0.16 TOTAL RUNOFF(CFS) = 1.03

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FLOW PROCESS FROM NODE      275.00 TO NODE      276.00 IS CODE =  61
-----
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>(STANDARD CURB SECTION USED)<<<<
=====
UPSTREAM ELEVATION(FEET) = 1343.00  DOWNSTREAM ELEVATION(FEET) = 1211.00
STREET LENGTH(FEET) = 1424.00  CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 14.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 7.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curb) = 0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 22.92
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.36
HALFSTREET FLOOD WIDTH(FEET) = 11.84
AVERAGE FLOW VELOCITY(FEET/SEC.) = 7.54
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.74
STREET FLOW TRAVEL TIME(MIN.) = 3.15  Tc(MIN.) = 7.75
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.158
*USER SPECIFIED(SUBAREA):
NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7900
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.790
SUBAREA AREA(ACRES) = 8.86  SUBAREA RUNOFF(CFS) = 43.10
TOTAL AREA(ACRES) = 9.0  PEAK FLOW RATE(CFS) = 43.88

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.43  HALFSTREET FLOOD WIDTH(FEET) = 14.00
FLOW VELOCITY(FEET/SEC.) = 9.10  DEPTH*VELOCITY(FT*FT/SEC.) = 3.91
LONGEST FLOWPATH FROM NODE 274.00 TO NODE 276.00 = 1494.00 FEET.

*****
FLOW PROCESS FROM NODE      276.00 TO NODE      277.00 IS CODE =  31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1206.00  DOWNSTREAM(FEET) = 1205.00
FLOW LENGTH(FEET) = 50.00  MANNING'S N = 0.013
DEPTH OF FLOW IN 30.0 INCH PIPE IS 19.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 12.73
ESTIMATED PIPE DIAMETER(INCH) = 30.00  NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 43.88
PIPE TRAVEL TIME(MIN.) = 0.07  Tc(MIN.) = 7.81
LONGEST FLOWPATH FROM NODE 274.00 TO NODE 277.00 = 1544.00 FEET.

*****
FLOW PROCESS FROM NODE      277.00 TO NODE      277.00 IS CODE =  1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 7.81
RAINFALL INTENSITY(INCH/HR) = 6.13
TOTAL STREAM AREA(ACRES) = 9.02
PEAK FLOW RATE(CFS) AT CONFLUENCE = 43.88

** CONFLUENCE DATA **
STREAM  RUNOFF      Tc      INTENSITY      AREA
NUMBER  (CFS)      (MIN.)  (INCH/HOUR)  (ACRE)
1        4.51      13.30      4.345      1.23
2       43.88      7.81      6.125      9.02

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

** PEAK FLOW RATE TABLE **
STREAM  RUNOFF      Tc      INTENSITY
NUMBER  (CFS)      (MIN.)  (INCH/HOUR)
1        46.53      7.81      6.125
2        35.64     13.30      4.345

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 46.53  Tc(MIN.) = 7.81
TOTAL AREA(ACRES) = 10.2
LONGEST FLOWPATH FROM NODE 270.00 TO NODE 277.00 = 1903.00 FEET.

*****
FLOW PROCESS FROM NODE      277.00 TO NODE      278.00 IS CODE =  31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1205.00  DOWNSTREAM(FEET) = 1204.00
FLOW LENGTH(FEET) = 122.00  MANNING'S N = 0.013
DEPTH OF FLOW IN 33.0 INCH PIPE IS 27.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 22.73
ESTIMATED PIPE DIAMETER(INCH) = 18.00  NUMBER OF PIPES = 1

PIPE-FLOW VELOCITY(FEET/SEC.) = 8.96
ESTIMATED PIPE DIAMETER(INCH) = 33.00  NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 46.53
PIPE TRAVEL TIME(MIN.) = 0.23  Tc(MIN.) = 8.04
LONGEST FLOWPATH FROM NODE 270.00 TO NODE 278.00 = 2025.00 FEET.

*****
FLOW PROCESS FROM NODE      278.00 TO NODE      279.00 IS CODE =  31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1204.00  DOWNSTREAM(FEET) = 1170.00
FLOW LENGTH(FEET) = 465.00  MANNING'S N = 0.013
DEPTH OF FLOW IN 24.0 INCH PIPE IS 15.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 20.99
ESTIMATED PIPE DIAMETER(INCH) = 24.00  NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 46.53
PIPE TRAVEL TIME(MIN.) = 0.37  Tc(MIN.) = 8.41
LONGEST FLOWPATH FROM NODE 270.00 TO NODE 279.00 = 2490.00 FEET.

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*****
FLOW PROCESS FROM NODE      282.00 TO NODE      283.00 IS CODE =  21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 70.00
UPSTREAM ELEVATION(FEET) = 1310.00
DOWNSTREAM ELEVATION(FEET) = 1309.00
ELEVATION DIFFERENCE(FEET) = 1.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 8.558
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.775
SUBAREA RUNOFF(CFS) = 0.24
TOTAL AREA(ACRES) = 0.09  TOTAL RUNOFF(CFS) = 0.24

*****
FLOW PROCESS FROM NODE      283.00 TO NODE      284.00 IS CODE =  61
-----
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>(STANDARD CURB SECTION USED)<<<<
=====
UPSTREAM ELEVATION(FEET) = 1310.00  DOWNSTREAM ELEVATION(FEET) = 1270.00
STREET LENGTH(FEET) = 1263.00  CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 14.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 7.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curb) = 0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.17
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.31
HALFSTREET FLOOD WIDTH(FEET) = 9.11
AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.78
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.17
STREET FLOW TRAVEL TIME(MIN.) = 5.57  Tc(MIN.) = 14.12
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.180
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.460
SUBAREA AREA(ACRES) = 7.07  SUBAREA RUNOFF(CFS) = 13.60
TOTAL AREA(ACRES) = 7.2  PEAK FLOW RATE(CFS) = 13.77

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.37  HALFSTREET FLOOD WIDTH(FEET) = 12.00
FLOW VELOCITY(FEET/SEC.) = 4.42  DEPTH*VELOCITY(FT*FT/SEC.) = 1.62
LONGEST FLOWPATH FROM NODE 282.00 TO NODE 284.00 = 1333.00 FEET.

*****
FLOW PROCESS FROM NODE      284.00 TO NODE      285.00 IS CODE =  31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1270.00  DOWNSTREAM(FEET) = 1040.00
FLOW LENGTH(FEET) = 1141.00  MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 6.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 22.73
ESTIMATED PIPE DIAMETER(INCH) = 18.00  NUMBER OF PIPES = 1

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PIPE-FLOW(CFS) = 13.77
PIPE TRAVEL TIME(MIN.) = 0.84 Tc(MIN.) = 14.96
LONGEST FLOWPATH FROM NODE 282.00 TO NODE 285.00 = 2474.00 FEET.

FLOW PROCESS FROM NODE 284.00 TO NODE 285.00 IS CODE = 81

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

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.028
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3668
SUBAREA AREA(ACRES) = 39.72 SUBAREA RUNOFF(CFS) = 56.00
TOTAL AREA(ACRES) = 46.9 TOTAL RUNOFF(CFS) = 69.27
Tc(MIN.) = 14.96

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FLOW PROCESS FROM NODE 294.00 TO NODE 295.00 IS CODE = 21

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

*USER SPECIFIED(SUBAREA):
RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(Feet) = 70.00
UPSTREAM ELEVATION(Feet) = 1263.00
DOWNSTREAM ELEVATION(Feet) = 1262.00
ELEVATION DIFFERENCE(Feet) = 1.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 8.558
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.775
SUBAREA RUNOFF(CFS) = 0.24
TOTAL AREA(ACRES) = 0.09 TOTAL RUNOFF(CFS) = 0.24

FLOW PROCESS FROM NODE 295.00 TO NODE 296.00 IS CODE = 61

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>(STANDARD CURB SECTION USED)<<<<

UPSTREAM ELEVATION(Feet) = 1262.00 DOWNSTREAM ELEVATION(Feet) = 1076.00
STREET LENGTH(Feet) = 1629.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(Feet) = 14.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(Feet) = 7.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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) = 6.49
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(Feet) = 0.25
HALFSTREET FLOOD WIDTH(Feet) = 6.36
AVERAGE FLOW VELOCITY(Feet/Sec.) = 6.22
PRODUCT OF DEPTH&VELOCITY(Ft*Ft/Sec.) = 1.58
STREET FLOW TRAVEL TIME(MIN.) = 4.37 Tc(MIN.) = 12.92
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.427
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.460
SUBAREA AREA(ACRES) = 6.09 SUBAREA RUNOFF(CFS) = 12.40
TOTAL AREA(ACRES) = 6.2 PEAK FLOW RATE(CFS) = 12.58

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(Feet) = 0.30 HALFSTREET FLOOD WIDTH(Feet) = 8.78
FLOW VELOCITY(Feet/Sec.) = 7.08 DEPTH*VELOCITY(Ft*Ft/Sec.) = 2.14
LONGEST FLOWPATH FROM NODE 294.00 TO NODE 296.00 = 1699.00 FEET.

FLOW PROCESS FROM NODE 296.00 TO NODE 296.00 IS CODE = 1

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

TOTAL NUMBER OF STREAMS = 3
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 12.92
RAINFALL INTENSITY(INCH/HR) = 4.43
TOTAL STREAM AREA(ACRES) = 6.18
PEAK FLOW RATE(CFS) AT CONFLUENCE = 12.58

FLOW PROCESS FROM NODE 290.00 TO NODE 291.00 IS CODE = 21

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

*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(Feet) = 100.00
UPSTREAM ELEVATION(Feet) = 1230.00
DOWNSTREAM ELEVATION(Feet) = 1220.00
ELEVATION DIFFERENCE(Feet) = 10.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 6.267
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.061
SUBAREA RUNOFF(CFS) = 0.57
TOTAL AREA(ACRES) = 0.23 TOTAL RUNOFF(CFS) = 0.57

FLOW PROCESS FROM NODE 291.00 TO NODE 292.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(Feet) = 1230.00 DOWNSTREAM(Feet) = 1130.00
FLOW LENGTH(Feet) = 725.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 1.5 INCHES
PIPE-FLOW VELOCITY(Feet/Sec.) = 7.81
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 0.57
PIPE TRAVEL TIME(MIN.) = 1.55 Tc(MIN.) = 7.81
LONGEST FLOWPATH FROM NODE 290.00 TO NODE 292.00 = 825.00 FEET.

FLOW PROCESS FROM NODE 291.00 TO NODE 292.00 IS CODE = 81

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

100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.124
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 4.66 SUBAREA RUNOFF(CFS) = 9.99
TOTAL AREA(ACRES) = 4.9 TOTAL RUNOFF(CFS) = 10.48
Tc(MIN.) = 7.81

FLOW PROCESS FROM NODE 292.00 TO NODE 296.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(Feet) = 1130.00 DOWNSTREAM(Feet) = 1075.00
FLOW LENGTH(Feet) = 483.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 6.8 INCHES
PIPE-FLOW VELOCITY(Feet/Sec.) = 17.14
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 10.48
PIPE TRAVEL TIME(MIN.) = 0.47 Tc(MIN.) = 8.28
LONGEST FLOWPATH FROM NODE 290.00 TO NODE 296.00 = 1308.00 FEET.

FLOW PROCESS FROM NODE 296.00 TO NODE 296.00 IS CODE = 1

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

TOTAL NUMBER OF STREAMS = 3
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 8.28
RAINFALL INTENSITY(INCH/HR) = 5.90
TOTAL STREAM AREA(ACRES) = 4.89
PEAK FLOW RATE(CFS) AT CONFLUENCE = 10.48

FLOW PROCESS FROM NODE 297.00 TO NODE 298.00 IS CODE = 21

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

*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(Feet) = 100.00
UPSTREAM ELEVATION(Feet) = 1150.00
DOWNSTREAM ELEVATION(Feet) = 1140.00
ELEVATION DIFFERENCE(Feet) = 10.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 6.267
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.061
SUBAREA RUNOFF(CFS) = 1.48
TOTAL AREA(ACRES) = 0.60 TOTAL RUNOFF(CFS) = 1.48

FLOW PROCESS FROM NODE 298.00 TO NODE 299.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<

```

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1140.00 DOWNSTREAM(FEET) = 1080.00
FLOW LENGTH(FEET) = 495.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 2.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 9.93
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 1.48
PIPE TRAVEL TIME(MIN.) = 0.83 Tc(MIN.) = 7.10
LONGEST FLOWPATH FROM NODE 297.00 TO NODE 299.00 = 595.00 FEET.

*****
FLOW PROCESS FROM NODE 298.00 TO NODE 299.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.516
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 3.42 SUBAREA RUNOFF(CFS) = 7.80
TOTAL AREA(ACRES) = 4.0 TOTAL RUNOFF(CFS) = 9.17
Tc(MIN.) = 7.10

*****
FLOW PROCESS FROM NODE 299.00 TO NODE 296.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 3
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 3 ARE:
TIME OF CONCENTRATION(MIN.) = 7.10
RAINFALL INTENSITY(INCH/HR) = 6.52
TOTAL STREAM AREA(ACRES) = 4.02
PEAK FLOW RATE(CFS) AT CONFLUENCE = 9.17

** CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 12.58 12.92 4.427 6.18
2 10.48 8.28 5.898 4.89
3 9.17 7.10 6.516 4.02

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 3 STREAMS.

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 25.06 7.10 6.516
2 26.85 8.28 5.898
3 26.68 12.92 4.427

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 26.85 Tc(MIN.) = 8.28
TOTAL AREA(ACRES) = 15.1
LONGEST FLOWPATH FROM NODE 294.00 TO NODE 296.00 = 1699.00 FEET.

*****
FLOW PROCESS FROM NODE 296.00 TO NODE 303.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1075.00 DOWNSTREAM(FEET) = 1046.00
FLOW LENGTH(FEET) = 722.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 21.0 INCH PIPE IS 15.1 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 14.49
ESTIMATED PIPE DIAMETER(INCH) = 21.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 26.85
PIPE TRAVEL TIME(MIN.) = 0.83 Tc(MIN.) = 9.11
LONGEST FLOWPATH FROM NODE 294.00 TO NODE 303.00 = 2421.00 FEET.

*****
FLOW PROCESS FROM NODE 303.00 TO NODE 303.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 9.11
RAINFALL INTENSITY(INCH/HR) = 5.55
TOTAL STREAM AREA(ACRES) = 15.09
PEAK FLOW RATE(CFS) AT CONFLUENCE = 26.85

*****
FLOW PROCESS FROM NODE 300.00 TO NODE 301.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 1240.00
DOWNSTREAM ELEVATION(FEET) = 1230.00
ELEVATION DIFFERENCE(FEET) = 10.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 6.267
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.061
SUBAREA RUNOFF(CFS) = 0.54
TOTAL AREA(ACRES) = 0.22 TOTAL RUNOFF(CFS) = 0.54

*****
FLOW PROCESS FROM NODE 301.00 TO NODE 302.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1230.00 DOWNSTREAM(FEET) = 1050.00
FLOW LENGTH(FEET) = 1075.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 1.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 8.24
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 0.54
PIPE TRAVEL TIME(MIN.) = 2.17 Tc(MIN.) = 8.44
LONGEST FLOWPATH FROM NODE 300.00 TO NODE 302.00 = 1175.00 FEET.

*****
FLOW PROCESS FROM NODE 301.00 TO NODE 302.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.827
*USER SPECIFIED(SUBAREA):
URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 8.81 SUBAREA RUNOFF(CFS) = 17.97
TOTAL AREA(ACRES) = 9.0 TOTAL RUNOFF(CFS) = 18.42
Tc(MIN.) = 8.44

*****
FLOW PROCESS FROM NODE 302.00 TO NODE 303.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1050.00 DOWNSTREAM(FEET) = 1049.00
FLOW LENGTH(FEET) = 50.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 21.0 INCH PIPE IS 14.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 10.18
ESTIMATED PIPE DIAMETER(INCH) = 21.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 18.42
PIPE TRAVEL TIME(MIN.) = 0.08 Tc(MIN.) = 8.52
LONGEST FLOWPATH FROM NODE 300.00 TO NODE 303.00 = 1225.00 FEET.

*****
FLOW PROCESS FROM NODE 303.00 TO NODE 303.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 8.52
RAINFALL INTENSITY(INCH/HR) = 5.79
TOTAL STREAM AREA(ACRES) = 9.03
PEAK FLOW RATE(CFS) AT CONFLUENCE = 18.42

** CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 26.85 9.11 5.546 15.09
2 18.42 8.52 5.791 9.03

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

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 44.13 8.52 5.791
2 44.48 9.11 5.546

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 44.48 Tc(MIN.) = 9.11
TOTAL AREA(ACRES) = 24.1
LONGEST FLOWPATH FROM NODE 294.00 TO NODE 303.00 = 2421.00 FEET.

*****
FLOW PROCESS FROM NODE 303.00 TO NODE 304.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====

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ELEVATION DATA: UPSTREAM(FEET) = 1049.00 DOWNSTREAM(FEET) = 1043.00
FLOW LENGTH(FEET) = 130.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 24.0 INCH PIPE IS 18.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 17.14
ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 44.48
PIPE TRAVEL TIME(MIN.) = 0.13 Tc(MIN.) = 9.24
LONGEST FLOWPATH FROM NODE 294.00 TO NODE 304.00 = 2551.00 FEET.

*****
FLOW PROCESS FROM NODE 304.00 TO NODE 304.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 9.24
RAINFALL INTENSITY(INCH/HR) = 5.50
TOTAL STREAM AREA(ACRES) = 24.12
PEAK FLOW RATE(CFS) AT CONFLUENCE = 44.48

*****
FLOW PROCESS FROM NODE 305.00 TO NODE 306.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 70.00
UPSTREAM ELEVATION(FEET) = 1078.50
DOWNSTREAM ELEVATION(FEET) = 1078.00
ELEVATION DIFFERENCE(FEET) = 0.50
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 9.863
WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
THE MAXIMUM OVERLAND FLOW LENGTH = 58.57
(Reference: Table 3-1B of Hydrology Manual)
THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.270
SUBAREA RUNOFF(CFS) = 0.22
TOTAL AREA(ACRES) = 0.09 TOTAL RUNOFF(CFS) = 0.22

*****
FLOW PROCESS FROM NODE 306.00 TO NODE 307.00 IS CODE = 61
-----
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>(STANDARD CURB SECTION USED)<<<<
=====
UPSTREAM ELEVATION(FEET) = 1078.00 DOWNSTREAM ELEVATION(FEET) = 1044.00
STREET LENGTH(FEET) = 780.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 14.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 7.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curb) = 0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.67
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.25
HALFSTREET FLOOD WIDTH(FEET) = 6.10
AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.74
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.93
STREET FLOW TRAVEL TIME(MIN.) = 3.47 Tc(MIN.) = 13.33
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.338
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.460
SUBAREA AREA(ACRES) = 3.44 SUBAREA RUNOFF(CFS) = 6.87
TOTAL AREA(ACRES) = 3.5 PEAK FLOW RATE(CFS) = 7.04

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.29 HALFSTREET FLOOD WIDTH(FEET) = 8.39
FLOW VELOCITY(FEET/SEC.) = 4.28 DEPTH*VELOCITY(FT*FT/SEC.) = 1.26
LONGEST FLOWPATH FROM NODE 305.00 TO NODE 307.00 = 850.00 FEET.

*****
FLOW PROCESS FROM NODE 307.00 TO NODE 304.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1045.00 DOWNSTREAM(FEET) = 1044.00
FLOW LENGTH(FEET) = 50.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 8.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 8.14
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 7.04
PIPE TRAVEL TIME(MIN.) = 0.10 Tc(MIN.) = 13.44

LONGEST FLOWPATH FROM NODE 305.00 TO NODE 304.00 = 900.00 FEET.

*****
FLOW PROCESS FROM NODE 304.00 TO NODE 304.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 13.44
RAINFALL INTENSITY(INCH/HR) = 4.32
TOTAL STREAM AREA(ACRES) = 3.53
PEAK FLOW RATE(CFS) AT CONFLUENCE = 7.04

** CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 44.48 9.24 5.496 24.12
2 7.04 13.44 4.317 3.53

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

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 49.33 9.24 5.496
2 41.98 13.44 4.317

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 49.33 Tc(MIN.) = 9.24
TOTAL AREA(ACRES) = 27.7
LONGEST FLOWPATH FROM NODE 294.00 TO NODE 304.00 = 2551.00 FEET.

*****
FLOW PROCESS FROM NODE 304.00 TO NODE 308.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1044.00 DOWNSTREAM(FEET) = 1040.00
FLOW LENGTH(FEET) = 75.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 24.0 INCH PIPE IS 19.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 18.47
ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 49.33
PIPE TRAVEL TIME(MIN.) = 0.07 Tc(MIN.) = 9.31
LONGEST FLOWPATH FROM NODE 294.00 TO NODE 308.00 = 2626.00 FEET.

+-----+
| |
| |
| |
+-----+

*****
FLOW PROCESS FROM NODE 310.00 TO NODE 311.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 1160.00
DOWNSTREAM ELEVATION(FEET) = 1150.00
ELEVATION DIFFERENCE(FEET) = 10.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 6.267
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 7.061
SUBAREA RUNOFF(CFS) = 0.86
TOTAL AREA(ACRES) = 0.35 TOTAL RUNOFF(CFS) = 0.86

*****
FLOW PROCESS FROM NODE 311.00 TO NODE 312.00 IS CODE = 53
-----
>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1150.00 DOWNSTREAM(FEET) = 1045.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 972.00 CHANNEL SLOPE = 0.1080
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) = 0.86
FLOW VELOCITY(FEET/SEC) = 1.84 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 8.80 Tc(MIN.) = 15.07
LONGEST FLOWPATH FROM NODE 310.00 TO NODE 312.00 = 1072.00 FEET.

*****
FLOW PROCESS FROM NODE 311.00 TO NODE 312.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.009
*USER SPECIFIED(SUBAREA):

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NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 20.75 SUBAREA RUNOFF(CFS) = 29.12
TOTAL AREA(ACRES) = 21.1 TOTAL RUNOFF(CFS) = 29.61
TC(MIN.) = 15.07

*****
FLOW PROCESS FROM NODE 312.00 TO NODE 313.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1045.00 DOWNSTREAM(FEET) = 1043.00
FLOW LENGTH(FEET) = 123.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 27.0 INCH PIPE IS 17.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 10.68
ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 29.61
PIPE TRAVEL TIME(MIN.) = 0.19 Tc(MIN.) = 15.26
LONGEST FLOWPATH FROM NODE 310.00 TO NODE 313.00 = 1195.00 FEET.

*****
FLOW PROCESS FROM NODE 312.00 TO NODE 313.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.977
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
SUBAREA AREA(ACRES) = 4.30 SUBAREA RUNOFF(CFS) = 5.99
TOTAL AREA(ACRES) = 25.4 TOTAL RUNOFF(CFS) = 35.35
TC(MIN.) = 15.26

*****
FLOW PROCESS FROM NODE 313.00 TO NODE 313.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 15.26
RAINFALL INTENSITY(INCH/HR) = 3.98
TOTAL STREAM AREA(ACRES) = 25.40
PEAK FLOW RATE(CFS) AT CONFLUENCE = 35.35

*****
FLOW PROCESS FROM NODE 315.00 TO NODE 316.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
=====
*USER SPECIFIED(SUBAREA):
NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 85.00
UPSTREAM ELEVATION(FEET) = 1075.00
DOWNSTREAM ELEVATION(FEET) = 1072.00
ELEVATION DIFFERENCE(FEET) = 3.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 2.725
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 8.168
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) = 2.01
TOTAL AREA(ACRES) = 0.29 TOTAL RUNOFF(CFS) = 2.01

*****
FLOW PROCESS FROM NODE 316.00 TO NODE 317.00 IS CODE = 61
-----
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>(STANDARD CURB SECTION USED)<<<<
=====
UPSTREAM ELEVATION(FEET) = 1072.00 DOWNSTREAM ELEVATION(FEET) = 1050.00
STREET LENGTH(FEET) = 547.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 15.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 7.50
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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) = 6.80
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.29
HALFSTREET FLOOD WIDTH(FEET) = 8.41
AVERAGE FLOW VELOCITY(FEET/SEC.) = 4.12
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.21
STREET FLOW TRAVEL TIME(MIN.) = 2.21 Tc(MIN.) = 4.94
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 8.168
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
*USER SPECIFIED(SUBAREA):

NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.8500
SUBAREA AREA(ACRES) = 1.38 SUBAREA RUNOFF(CFS) = 9.58
TOTAL AREA(ACRES) = 1.7 PEAK FLOW RATE(CFS) = 11.59

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.34 HALFSTREET FLOOD WIDTH(FEET) = 10.63
FLOW VELOCITY(FEET/SEC.) = 4.64 DEPTH*VELOCITY(FT*FT/SEC.) = 1.57
LONGEST FLOWPATH FROM NODE 315.00 TO NODE 317.00 = 632.00 FEET.

*****
FLOW PROCESS FROM NODE 317.00 TO NODE 313.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1044.00 DOWNSTREAM(FEET) = 1043.00
FLOW LENGTH(FEET) = 70.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 14.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 7.88
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 11.59
PIPE TRAVEL TIME(MIN.) = 0.15 Tc(MIN.) = 5.08
LONGEST FLOWPATH FROM NODE 315.00 TO NODE 313.00 = 702.00 FEET.

*****
FLOW PROCESS FROM NODE 313.00 TO NODE 313.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 5.08
RAINFALL INTENSITY(INCH/HR) = 8.08
TOTAL STREAM AREA(ACRES) = 1.67
PEAK FLOW RATE(CFS) AT CONFLUENCE = 11.59

** CONFLUENCE DATA **
STREAM RUNOFF Tc INTENSITY AREA
NUMBER (CFS) (MIN.) (INCH/HOUR) (ACRE)
1 35.35 15.26 3.977 25.40
2 11.59 5.08 8.080 1.67

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

** PEAK FLOW RATE TABLE **
STREAM RUNOFF Tc INTENSITY
NUMBER (CFS) (MIN.) (INCH/HOUR)
1 23.37 5.08 8.080
2 41.06 15.26 3.977

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 41.06 Tc(MIN.) = 15.26
TOTAL AREA(ACRES) = 27.1
LONGEST FLOWPATH FROM NODE 310.00 TO NODE 313.00 = 1195.00 FEET.

=====
END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 27.1 TC(MIN.) = 15.26
PEAK FLOW RATE(CFS) = 41.06
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END OF RATIONAL METHOD ANALYSIS

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