MERRIAM MOUNTAINS SPECIFIC PLAN

APPENDIX P – PART 2

HYDROLOGY/HYDRAULIC REPORT

GPA 04-06; SP 04-006; R04-013; VTM5381; S04-035, S04-036, S04-037, S04-038; Log No. 04-08-028; SCH No. 2004091166

for the

DRAFT ENVIRONMENTAL IMPACT REPORT

August 2007

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 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.952
*USER SPECIFIED(SUBAREA):
RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7800
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT =  0.781
SUBAREA AREA(ACRES) =     2.87      SUBAREA RUNOFF(CFS) =   15.56
TOTAL AREA(ACRES) =       3.12        PEAK FLOW RATE(CFS) =      16.94

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.45   HALFSTREET FLOOD WIDTH(FEET) =  16.00
FLOW VELOCITY(FEET/SEC.) =  3.08   DEPTH*VELOCITY(FT*FT/SEC.) =   1.39
LONGEST FLOWPATH FROM NODE   1329.00 TO NODE   1327.00 =   545.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   1327.00 TO NODE   1326.00 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =  1290.00  DOWNSTREAM(FEET) =  1285.00
FLOW LENGTH(FEET) =   264.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =   9.59
ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =     16.94
PIPE TRAVEL TIME(MIN.) =   0.46    Tc(MIN.) =   8.21
LONGEST FLOWPATH FROM NODE   1329.00 TO NODE   1326.00 =   809.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   1326.10 TO NODE   1326.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.699
*USER SPECIFIED(SUBAREA):
RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.7768
SUBAREA AREA(ACRES) =     1.82   SUBAREA RUNOFF(CFS) =    9.39
TOTAL AREA(ACRES) =       4.94   TOTAL RUNOFF(CFS) =   25.71
TC(MIN.) =   8.21

****************************************************************************
FLOW PROCESS FROM NODE   1326.00 TO NODE   1325.00 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =  1285.00  DOWNSTREAM(FEET) =  1283.00
FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =  12.19
ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =     25.71
PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =   8.31
LONGEST FLOWPATH FROM NODE   1329.00 TO NODE   1325.00 =   884.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   1325.10 TO NODE   1325.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.645
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```
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =  0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7749
 SUBAREA AREA(ACRES) =     1.98   SUBAREA RUNOFF(CFS) =   10.13
 TOTAL AREA(ACRES) =       6.92   TOTAL RUNOFF(CFS) =   35.63
 TC(MIN.) =   8.31

****************************************************************************
 FLOW PROCESS FROM NODE   1325.00 TO NODE   1324.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1283.00  DOWNSTREAM(FEET) =  1280.00
 FLOW LENGTH(FEET) =   387.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  33.0 INCH PIPE IS  22.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.27
 ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     35.63
 PIPE TRAVEL TIME(MIN.) =   0.78    Tc(MIN.) =   9.09
 LONGEST FLOWPATH FROM NODE   1329.00 TO NODE   1324.00 =  1271.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1324.00 TO NODE   1324.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.272
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =  0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7742
 SUBAREA AREA(ACRES) =     1.08   SUBAREA RUNOFF(CFS) =    5.22
 TOTAL AREA(ACRES) =       8.00   TOTAL RUNOFF(CFS) =   38.85
 TC(MIN.) =   9.09

****************************************************************************
 FLOW PROCESS FROM NODE   1324.00 TO NODE   1322.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1280.00  DOWNSTREAM(FEET) =  1275.00
 FLOW LENGTH(FEET) =   235.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  12.21
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     38.85
 PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =   9.41
 LONGEST FLOWPATH FROM NODE   1329.00 TO NODE   1322.00 =  1506.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1323.00 TO NODE   1322.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.133
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
 S.C.S. CURVE NUMBER (AMC II) =  0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7785
 SUBAREA AREA(ACRES) =     2.95   SUBAREA RUNOFF(CFS) =   14.29
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 TOTAL AREA(ACRES) =     10.95   TOTAL RUNOFF(CFS) =   52.28
 TC(MIN.) =   9.41

****************************************************************************
 FLOW PROCESS FROM NODE   1322.00 TO NODE   1321.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1275.00  DOWNSTREAM(FEET) =  1165.00
 FLOW LENGTH(FEET) =   355.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  35.70
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     52.28
 PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =   9.58
 LONGEST FLOWPATH FROM NODE   1329.00 TO NODE   1321.00 =  1861.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1321.00 TO NODE   1320.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1165.00  DOWNSTREAM(FEET) =   1045.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   480.00   CHANNEL SLOPE =  0.2500
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1800 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     52.28
 FLOW VELOCITY(FEET/SEC) =   8.87 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   0.90   Tc(MIN.) =  10.48
 LONGEST FLOWPATH FROM NODE   1329.00 TO NODE   1320.00 =  2341.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1321.00 TO NODE   1320.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.722
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3200
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5983
 SUBAREA AREA(ACRES) =    7.09   SUBAREA RUNOFF(CFS) =   12.98
 TOTAL AREA(ACRES) =     18.04   TOTAL RUNOFF(CFS) =   61.76
 TC(MIN.) =  10.48

****************************************************************************
 FLOW PROCESS FROM NODE   1320.00 TO NODE   1310.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1045.00  DOWNSTREAM(FEET) =    840.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   618.00   CHANNEL SLOPE =  0.3317
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2021 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     61.76
 FLOW VELOCITY(FEET/SEC) =   9.94 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.04   Tc(MIN.) =  11.51
 LONGEST FLOWPATH FROM NODE   1329.00 TO NODE   1310.00 =  2959.00 FEET.

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 FLOW PROCESS FROM NODE   1320.00 TO NODE   1310.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.385
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5099
 SUBAREA AREA(ACRES) =    6.38   SUBAREA RUNOFF(CFS) =    8.93
 TOTAL AREA(ACRES) =     24.42   TOTAL RUNOFF(CFS) =   67.05
 TC(MIN.) =  11.51

****************************************************************************
 FLOW PROCESS FROM NODE   1310.00 TO NODE   1310.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  11.51
 RAINFALL INTENSITY(INCH/HR) =   5.38
 TOTAL STREAM AREA(ACRES) =    24.42
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     67.05

****************************************************************************
 FLOW PROCESS FROM NODE   1313.00 TO NODE   1312.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3100
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1282.00
 DOWNSTREAM ELEVATION(FEET) =   1240.00
 ELEVATION DIFFERENCE(FEET) =     42.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.601
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.709
 SUBAREA RUNOFF(CFS) =      0.93
 TOTAL AREA(ACRES) =      0.39   TOTAL RUNOFF(CFS) =      0.93

****************************************************************************
 FLOW PROCESS FROM NODE   1312.00 TO NODE   1311.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1240.00  DOWNSTREAM(FEET) =   1075.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   835.00   CHANNEL SLOPE =  0.1976
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1588 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.93
 FLOW VELOCITY(FEET/SEC) =   2.23 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   6.24   Tc(MIN.) =  12.84
 LONGEST FLOWPATH FROM NODE   1313.00 TO NODE   1311.00 =   935.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1312.00 TO NODE   1311.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
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 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.020
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2700
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.2714
SUBAREA AREA(ACRES) =   10.66   SUBAREA RUNOFF(CFS) =   14.45
TOTAL AREA(ACRES) =     11.05   TOTAL RUNOFF(CFS) =   15.05
TC(MIN.) =  12.84

****************************************************************************
FLOW PROCESS FROM NODE   1311.00 TO NODE   1310.00 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1075.00  DOWNSTREAM(FEET) =    840.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   725.00   CHANNEL SLOPE =  0.3241
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .2007 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) =     15.05
FLOW VELOCITY(FEET/SEC) =   6.19 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   1.95   Tc(MIN.) =  14.79
LONGEST FLOWPATH FROM NODE   1313.00 TO NODE   1310.00 =  1660.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   1311.00 TO NODE   1310.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.582
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.2640
SUBAREA AREA(ACRES) =    5.84   SUBAREA RUNOFF(CFS) =    6.69
TOTAL AREA(ACRES) =     16.89   TOTAL RUNOFF(CFS) =   20.43
TC(MIN.) =  14.79

****************************************************************************
FLOW PROCESS FROM NODE   1310.00 TO NODE   1310.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
TIME OF CONCENTRATION(MIN.) =  14.79
RAINFALL INTENSITY(INCH/HR) =   4.58
TOTAL STREAM AREA(ACRES) =    16.89
PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.43

** CONFLUENCE DATA **
STREAM     RUNOFF      Tc      INTENSITY      AREA
NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
   1       67.05    11.51        5.385         24.42
   2       20.43    14.79        4.582         16.89

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        82.95     11.51        5.385
    2        77.48     14.79        4.582

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     82.95   Tc(MIN.) =   11.51
 TOTAL AREA(ACRES) =     41.31
 LONGEST FLOWPATH FROM NODE   1329.00 TO NODE   1310.00 =  2959.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1310.00 TO NODE   1310.00 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        82.95     11.51        5.385       41.31
 LONGEST FLOWPATH FROM NODE   1329.00 TO NODE   1310.00 =  2959.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc       INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)    (INCH/HOUR)   (ACRE)
    1        48.57     11.18        5.488       19.12
 LONGEST FLOWPATH FROM NODE   1335.00 TO NODE   1310.00 =  2593.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc       INTENSITY
 NUMBER     (CFS)     (MIN.)    (INCH/HOUR)
    1      129.11      11.18        5.488
    2      130.61      11.51        5.385

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    130.61   Tc(MIN.) =   11.51
 TOTAL AREA(ACRES) =     60.43

****************************************************************************
 FLOW PROCESS FROM NODE   1310.00 TO NODE   1302.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    840.00  DOWNSTREAM(FEET) =    775.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   580.00   CHANNEL SLOPE =  0.1121
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1091 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =    130.61
 FLOW VELOCITY(FEET/SEC) =   9.37 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.03   Tc(MIN.) =  12.55
 LONGEST FLOWPATH FROM NODE   1329.00 TO NODE   1302.00 =  3539.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1310.00 TO NODE   1302.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.095
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4117
 SUBAREA AREA(ACRES) =    6.24   SUBAREA RUNOFF(CFS) =    8.58
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 TOTAL AREA(ACRES) =     66.67   TOTAL RUNOFF(CFS) =  139.83
 TC(MIN.) =  12.55

****************************************************************************
 FLOW PROCESS FROM NODE   1302.00 TO NODE   1302.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  12.55
 RAINFALL INTENSITY(INCH/HR) =   5.09
 TOTAL STREAM AREA(ACRES) =    66.67
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    139.83

****************************************************************************
 FLOW PROCESS FROM NODE   1307.00 TO NODE   1306.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4000
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1267.00
 DOWNSTREAM ELEVATION(FEET) =   1240.00
 ELEVATION DIFFERENCE(FEET) =     27.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.849
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.335
 SUBAREA RUNOFF(CFS) =      2.13
 TOTAL AREA(ACRES) =      0.64   TOTAL RUNOFF(CFS) =      2.13

****************************************************************************
 FLOW PROCESS FROM NODE   1306.00 TO NODE   1304.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1240.00  DOWNSTREAM(FEET) =   1045.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   935.00   CHANNEL SLOPE =  0.2086
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1643 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      2.13
 FLOW VELOCITY(FEET/SEC) =   2.92 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   5.33   Tc(MIN.) =  11.18
 LONGEST FLOWPATH FROM NODE   1307.00 TO NODE   1304.00 =  1035.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1306.00 TO NODE   1304.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.487
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2725
 SUBAREA AREA(ACRES) =    6.52   SUBAREA RUNOFF(CFS) =    9.30
 TOTAL AREA(ACRES) =      7.16   TOTAL RUNOFF(CFS) =   10.71
 TC(MIN.) =  11.18

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 FLOW PROCESS FROM NODE    1305.00 TO NODE    1304.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.487
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2714
 SUBAREA AREA(ACRES) =     6.11   SUBAREA RUNOFF(CFS) =     9.05
 TOTAL AREA(ACRES) =      13.27   TOTAL RUNOFF(CFS) =    19.76
 TC(MIN.) =  11.18

****************************************************************************
 FLOW PROCESS FROM NODE    1304.00 TO NODE    1303.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    1045.00  DOWNSTREAM(FEET) =     935.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.1833
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1517 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      19.76
 FLOW VELOCITY(FEET/SEC) =    5.89 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =    1.70   Tc(MIN.) =  12.88
 LONGEST FLOWPATH FROM NODE    1307.00 TO NODE    1303.00 =  1635.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    1304.00 TO NODE    1303.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.009
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2604
 SUBAREA AREA(ACRES) =    13.86   SUBAREA RUNOFF(CFS) =    17.36
 TOTAL AREA(ACRES) =      27.13   TOTAL RUNOFF(CFS) =    35.39
 TC(MIN.) =  12.88

****************************************************************************
 FLOW PROCESS FROM NODE    1303.00 TO NODE    1302.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     935.00  DOWNSTREAM(FEET) =     775.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1041.00   CHANNEL SLOPE =  0.1537
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1368 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      35.39
 FLOW VELOCITY(FEET/SEC) =    6.79 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =    2.55   Tc(MIN.) =  15.43
 LONGEST FLOWPATH FROM NODE    1307.00 TO NODE    1302.00 =  2676.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    1303.00 TO NODE    1302.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.457
```

```
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2700
 S.C.S. CURVE NUMBER (AMC II) =  0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2634
 SUBAREA AREA(ACRES) =   12.12   SUBAREA RUNOFF(CFS) =   14.59
 TOTAL AREA(ACRES) =     39.25   TOTAL RUNOFF(CFS) =   46.08
 TC(MIN.) =  15.43

****************************************************************************
 FLOW PROCESS FROM NODE   1302.00 TO NODE   1302.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  15.43
 RAINFALL INTENSITY(INCH/HR) =   4.46
 TOTAL STREAM AREA(ACRES) =    39.25
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     46.08

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY      AREA
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
     1       139.83     12.55         5.095         66.67
     2        46.08     15.43         4.457         39.25

 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       177.28     12.55         5.095
     2       168.41     15.43         4.457

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    177.28   Tc(MIN.) =   12.55
 TOTAL AREA(ACRES) =    105.92
 LONGEST FLOWPATH FROM NODE   1329.00 TO NODE   1302.00 =  3539.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1302.00 TO NODE   1301.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    775.00  DOWNSTREAM(FEET) =    760.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   130.00   CHANNEL SLOPE =  0.1154
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1115 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =    177.28
 FLOW VELOCITY(FEET/SEC) =  10.49 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   0.21   Tc(MIN.) =  12.75
 LONGEST FLOWPATH FROM NODE   1329.00 TO NODE   1301.00 =  3669.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1302.00 TO NODE   1301.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.041
 *USER SPECIFIED(SUBAREA):
```

```
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3550
  SUBAREA AREA(ACRES) =    2.75   SUBAREA RUNOFF(CFS) =    4.02
  TOTAL AREA(ACRES) =    108.67   TOTAL RUNOFF(CFS) =  194.50
  TC(MIN.) =  12.75

****************************************************************************
  FLOW PROCESS FROM NODE   1301.00 TO NODE   1301.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  13.05   RAIN INTENSITY(INCH/HOUR) =  4.97
  TOTAL AREA(ACRES) =   108.67   TOTAL RUNOFF(CFS) =     69.76

****************************************************************************
  FLOW PROCESS FROM NODE   1301.00 TO NODE     13.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   760.00  DOWNSTREAM(FEET) =   670.00
  FLOW LENGTH(FEET) =   665.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  13.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  28.78
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     69.76
  PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =  13.44
  LONGEST FLOWPATH FROM NODE   1329.00 TO NODE     13.00 =  4334.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    108.67  TC(MIN.) =     13.44
  PEAK FLOW RATE(CFS)   =     69.76
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS

```

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR14-P

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
1403	1402	2	1,075.0	1,030.0	85.0	0.25	0.14	
1402	1401	5	1,030.0	835.0	340.0			
1402	1401	8				0.25	3.79	
1401	14	4	835.0	720.0	615.0			EX. 24" CSP Caltrans
								Storm Drain
							3.93	Total Area

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

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          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
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                          Analysis prepared by:

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                       6390 GREENWICH DRIVE, SUITE 170
                         SAN DIEGO, CALIFORNIA 92122
                              (858) 554-1500

 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                 *
* SUBBASIN # 14                                                          *
* 2469.01A - OCTOBER 2006                                                *
 ************************************************************************

  FILE NAME: MERR14-P.DAT
  TIME/DATE OF STUDY: 14:55 09/28/2006
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   1403.00 TO NODE   1402.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =   1075.00
  DOWNSTREAM ELEVATION(FEET) =   1030.00
  ELEVATION DIFFERENCE(FEET) =     45.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.548
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.749
 SUBAREA RUNOFF(CFS) =      0.27
 TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.27

****************************************************************************
 FLOW PROCESS FROM NODE   1402.00 TO NODE   1401.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1030.00  DOWNSTREAM(FEET) =    835.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   340.00   CHANNEL SLOPE =  0.5735
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2287 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.27
 FLOW VELOCITY(FEET/SEC) =   2.68 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.12   Tc(MIN.) =   8.66
 LONGEST FLOWPATH FROM NODE   1403.00 TO NODE   1401.00 =   425.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1402.00 TO NODE   1401.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.469
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =     3.79   SUBAREA RUNOFF(CFS) =     6.13
 TOTAL AREA(ACRES) =      3.93   TOTAL RUNOFF(CFS) =    6.36
 TC(MIN.) =   8.66

****************************************************************************
 FLOW PROCESS FROM NODE   1401.00 TO NODE     14.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   835.00  DOWNSTREAM(FEET) =   720.00
 FLOW LENGTH(FEET) =   615.00   MANNING'S N =  0.024
 DEPTH OF FLOW IN  24.0 INCH PIPE IS   5.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.95
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      6.36
 PIPE TRAVEL TIME(MIN.) =   0.94    Tc(MIN.) =   9.60
 LONGEST FLOWPATH FROM NODE   1403.00 TO NODE     14.00 =  1040.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =      3.93  TC(MIN.) =      9.60
 PEAK FLOW RATE(CFS)   =      6.36
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR141-P

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
1412	1411	2	1,175.0	1,125.0	99.0	0.25	0.2	
1411	1410	5	1,125.0	900.0	358.0			
1411	1410	8				0.25	4.24	
1410	14.1	4	900.0	750.0	630.0			EX. 24" CSP Caltrans
								Storm Drain
							4.44	Total Area

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

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                          Analysis prepared by:

                     FUSCOE ENGINEERING - SAN DIEGO, INC
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                         SAN DIEGO, CALIFORNIA 92122
                              (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 141                                                          *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MER141-P.DAT
  TIME/DATE OF STUDY: 14:57 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   1412.00 TO NODE   1411.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    99.00
  UPSTREAM ELEVATION(FEET) =   1175.00
  DOWNSTREAM ELEVATION(FEET) =   1125.00
  ELEVATION DIFFERENCE(FEET) =     50.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.067
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.377
SUBAREA RUNOFF(CFS) =      0.37
TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      0.37

****************************************************************************
 FLOW PROCESS FROM NODE   1411.00 TO NODE   1410.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1125.00  DOWNSTREAM(FEET) =    900.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   358.00   CHANNEL SLOPE =  0.6285
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2300 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.37
 FLOW VELOCITY(FEET/SEC) =   2.69 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.22   Tc(MIN.) =   9.29
 LONGEST FLOWPATH FROM NODE   1412.00 TO NODE   1410.00 =   457.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1411.00 TO NODE   1410.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.185
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =     4.24   SUBAREA RUNOFF(CFS) =     6.56
 TOTAL AREA(ACRES) =      4.44   TOTAL RUNOFF(CFS) =    6.87
 TC(MIN.) =   9.29

****************************************************************************
 FLOW PROCESS FROM NODE   1410.00 TO NODE     14.10 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   900.00  DOWNSTREAM(FEET) =   750.00
 FLOW LENGTH(FEET) =   630.00   MANNING'S N =  0.024
 DEPTH OF FLOW IN  24.0 INCH PIPE IS   5.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  12.21
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      6.87
 PIPE TRAVEL TIME(MIN.) =   0.86    Tc(MIN.) =  10.15
 LONGEST FLOWPATH FROM NODE   1412.00 TO NODE     14.10 =  1087.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =      4.44  TC(MIN.) =     10.15
 PEAK FLOW RATE(CFS)   =      6.87
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR15-P

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
1509	1508	2	1,350.0	1,325.0	65.0	0.25	0.10	
1508	1507	5	1,325.0	1,135.0	550.0			
1508	1507	8				0.25	6.74	
1507	1506	5	1,135.0	990.0	709.0			
1507	1506	8				0.25	10.55	
1506	1505	5	990.0	904.0	250.0			
1506	1505	8				0.25	5.56	
1505	1504	4	904.0	857.0	220.0			Ex. 36" CSP/RCP
1504	1504	1						1 of 2
1504.3	1504.2	2	1,225.0	1,195.0	100.0	0.25	0.15	
1504.2	1504.1	5	1,195.0	891.0	1,110.0			
1504.2	1504.1	8				0.25	5.31	
1504.1	1504	4	891.0	857.0	574.0			Ex. 24" CSP/RCP
1504	1504	1						2 of 2
1504	1500	4	857.0	846.0	234.0			Ex. 42" RCP
1500	1500	1						1 of 2
1503	1502	2	1,290.0	1,260.0	100.0	0.25	0.24	
1502	1501	5	1,260.0	902.0	820.0			
1502	1501	8				0.25	7.1	
1501	1500	4	902.0	846.0	344.0			Ex. 24" CSP/RCP
1500	1500	1						2 of 2
1500	15	4	846.0	791.0	162.0			Ex. 48" CSP
							35.75	Total Area

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

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                              Analysis prepared by:

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                            SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 15                                                           *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MERR15-P.DAT
  TIME/DATE OF STUDY: 14:59 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   1509.00 TO NODE   1508.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    65.00
  UPSTREAM ELEVATION(FEET) =   1350.00
  DOWNSTREAM ELEVATION(FEET) =   1325.00
  ELEVATION DIFFERENCE(FEET) =     25.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.726
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.449
SUBAREA RUNOFF(CFS) =      0.21
TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.21

****************************************************************************
 FLOW PROCESS FROM NODE   1508.00 TO NODE   1507.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1325.00  DOWNSTREAM(FEET) =   1135.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   550.00   CHANNEL SLOPE =  0.3455
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2045 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.21
 FLOW VELOCITY(FEET/SEC) =   2.53 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.62   Tc(MIN.) =   9.35
 LONGEST FLOWPATH FROM NODE   1509.00 TO NODE   1507.00 =   615.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1508.00 TO NODE   1507.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.160
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =     6.74   SUBAREA RUNOFF(CFS) =   10.38
 TOTAL AREA(ACRES) =      6.84   TOTAL RUNOFF(CFS) =   10.53
 TC(MIN.) =   9.35

****************************************************************************
 FLOW PROCESS FROM NODE   1507.00 TO NODE   1506.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1135.00  DOWNSTREAM(FEET) =    990.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   709.00   CHANNEL SLOPE =  0.2045
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1623 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     10.53
 FLOW VELOCITY(FEET/SEC) =   4.94 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.39   Tc(MIN.) =  11.74
 LONGEST FLOWPATH FROM NODE   1509.00 TO NODE   1506.00 =  1324.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1507.00 TO NODE   1506.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.318
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =    10.55   SUBAREA RUNOFF(CFS) =   14.03
 TOTAL AREA(ACRES) =     17.39   TOTAL RUNOFF(CFS) =   23.12
 TC(MIN.) =  11.74
```

```
**************************************************************************
 FLOW PROCESS FROM NODE   1506.00 TO NODE   1505.00 IS CODE =  53
--------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    990.00  DOWNSTREAM(FEET) =    904.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   250.00   CHANNEL SLOPE =  0.3440
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2042 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     23.12
 FLOW VELOCITY(FEET/SEC) =   7.20 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   0.58   Tc(MIN.) =  12.32
 LONGEST FLOWPATH FROM NODE   1509.00 TO NODE   1505.00 =  1574.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE   1506.00 TO NODE   1505.00 IS CODE =  81
--------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.156
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =    5.56   SUBAREA RUNOFF(CFS) =    7.17
 TOTAL AREA(ACRES) =     22.95   TOTAL RUNOFF(CFS) =   29.58
 TC(MIN.) =  12.32

**************************************************************************
 FLOW PROCESS FROM NODE   1505.00 TO NODE   1504.00 IS CODE =  41
--------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   904.00  DOWNSTREAM(FEET) =   857.00
 FLOW LENGTH(FEET) =   220.00   MANNING'S N =  0.015
 DEPTH OF FLOW IN  36.0 INCH PIPE IS   8.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  23.98
 GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     29.58
 PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =  12.47
 LONGEST FLOWPATH FROM NODE   1509.00 TO NODE   1504.00 =  1794.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE   1504.00 TO NODE   1504.00 IS CODE =   1
--------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==========================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  12.47
 RAINFALL INTENSITY(INCH/HR) =   5.11
 TOTAL STREAM AREA(ACRES) =    22.95
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     29.58

**************************************************************************
 FLOW PROCESS FROM NODE   1504.30 TO NODE   1504.20 IS CODE =  21
--------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
```

```
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1225.00
 DOWNSTREAM ELEVATION(FEET) =   1195.00
 ELEVATION DIFFERENCE(FEET) =     30.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
 SUBAREA RUNOFF(CFS) =      0.28
 TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.28

****************************************************************************
 FLOW PROCESS FROM NODE   1504.20 TO NODE   1504.10 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1195.00  DOWNSTREAM(FEET) =    891.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1110.00   CHANNEL SLOPE =  0.2739
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1880 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.28
 FLOW VELOCITY(FEET/SEC) =   2.43 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   7.62   Tc(MIN.) =  14.72
 LONGEST FLOWPATH FROM NODE   1504.30 TO NODE   1504.10 =  1210.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1504.20 TO NODE   1504.10 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.595
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =     5.31   SUBAREA RUNOFF(CFS) =     6.10
 TOTAL AREA(ACRES) =      5.46   TOTAL RUNOFF(CFS) =    6.27
 TC(MIN.) =  14.72

****************************************************************************
 FLOW PROCESS FROM NODE   1504.10 TO NODE   1504.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   891.00  DOWNSTREAM(FEET) =   857.00
 FLOW LENGTH(FEET) =   574.00   MANNING'S N =  0.015
 DEPTH OF FLOW IN  24.0 INCH PIPE IS   6.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.13
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      6.27
 PIPE TRAVEL TIME(MIN.) =   0.94    Tc(MIN.) =  15.67
 LONGEST FLOWPATH FROM NODE   1504.30 TO NODE   1504.00 =  1784.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1504.00 TO NODE   1504.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
```

```
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  15.67
 RAINFALL INTENSITY(INCH/HR) =   4.41
 TOTAL STREAM AREA(ACRES) =     5.46
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.27

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY      AREA
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
     1        29.58     12.47         5.115        22.95
     2         6.27     15.67         4.415         5.46

 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        34.57     12.47         5.115
     2        31.80     15.67         4.415

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     34.57   Tc(MIN.) =   12.47
 TOTAL AREA(ACRES) =     28.41
 LONGEST FLOWPATH FROM NODE   1509.00 TO NODE   1504.00 =  1794.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1504.00 TO NODE   1500.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   857.00  DOWNSTREAM(FEET) =   846.00
 FLOW LENGTH(FEET) =   234.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  42.0 INCH PIPE IS  11.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  15.96
 GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     34.57
 PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =  12.71
 LONGEST FLOWPATH FROM NODE   1509.00 TO NODE   1500.00 =  2028.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1500.00 TO NODE   1500.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  12.71
 RAINFALL INTENSITY(INCH/HR) =   5.05
 TOTAL STREAM AREA(ACRES) =    28.41
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     34.57

****************************************************************************
 FLOW PROCESS FROM NODE   1503.00 TO NODE   1502.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1290.00
```

```
 DOWNSTREAM ELEVATION(FEET) =   1260.00
 ELEVATION DIFFERENCE(FEET) =     30.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
 SUBAREA RUNOFF(CFS) =      0.44
 TOTAL AREA(ACRES) =      0.24   TOTAL RUNOFF(CFS) =      0.44

****************************************************************************
 FLOW PROCESS FROM NODE   1502.00 TO NODE   1501.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1260.00  DOWNSTREAM(FEET) =    902.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   820.00   CHANNEL SLOPE =  0.4366
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2184 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.44
 FLOW VELOCITY(FEET/SEC) =   2.62 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   5.22   Tc(MIN.) =  12.32
 LONGEST FLOWPATH FROM NODE   1503.00 TO NODE   1501.00 =   920.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1502.00 TO NODE   1501.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.153
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =     7.10   SUBAREA RUNOFF(CFS) =     9.15
 TOTAL AREA(ACRES) =      7.34   TOTAL RUNOFF(CFS) =    9.46
 TC(MIN.) =  12.32

****************************************************************************
 FLOW PROCESS FROM NODE   1501.00 TO NODE   1500.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   902.00  DOWNSTREAM(FEET) =   846.00
 FLOW LENGTH(FEET) =   344.00   MANNING'S N =  0.015
 DEPTH OF FLOW IN  24.0 INCH PIPE IS   5.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  16.34
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      9.46
 PIPE TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =  12.68
 LONGEST FLOWPATH FROM NODE   1503.00 TO NODE   1500.00 =  1264.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1500.00 TO NODE   1500.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  12.68
 RAINFALL INTENSITY(INCH/HR) =   5.06
```

```
 TOTAL STREAM AREA(ACRES) =      7.34
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       9.46

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY       AREA
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)     (ACRE)
    1         34.57     12.71         5.051         28.41
    2          9.46     12.68         5.061          7.34

 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         43.96     12.68         5.061
    2         44.01     12.71         5.051

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      44.01   Tc(MIN.) =   12.71
 TOTAL AREA(ACRES) =      35.75
 LONGEST FLOWPATH FROM NODE   1509.00 TO NODE   1500.00 =  2028.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1500.00 TO NODE     15.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   846.00  DOWNSTREAM(FEET) =   791.00
 FLOW LENGTH(FEET) =   162.00   MANNING'S N =  0.024
 DEPTH OF FLOW IN  48.0 INCH PIPE IS  10.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  22.03
 GIVEN PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     44.01
 PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =  12.84
 LONGEST FLOWPATH FROM NODE   1509.00 TO NODE     15.00 =  2190.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =      35.75  TC(MIN.) =     12.84
 PEAK FLOW RATE(CFS)    =      44.01
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MER151-P

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
1512	1511	2	1,245.0	1,230.0	100.0	0.25	0.14	
1511	1510	5	1,230.0	908.0	920.0			
1511	1510	8				0.25	6.7	
1510	15.1	4	908.0	834.0	360.0			Ex. 24" CSP/RCP
							6.84	Total Area

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

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                        2003,1985,1981 HYDROLOGY MANUAL
       (c) Copyright 1982-2004 Advanced Engineering Software (aes)
           Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                          Analysis prepared by:

                      FUSCOE ENGINEERING - SAN DIEGO, INC
                        6390 GREENWICH DRIVE, SUITE 170
                          SAN DIEGO, CALIFORNIA 92122
                               (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 151                                                          *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MER151-P.DAT
  TIME/DATE OF STUDY: 15:00 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   1512.00 TO NODE   1511.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1245.00
  DOWNSTREAM ELEVATION(FEET) =   1230.00
  ELEVATION DIFFERENCE(FEET) =     15.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
SUBAREA RUNOFF(CFS) =      0.26
TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.26

****************************************************************************
 FLOW PROCESS FROM NODE   1511.00 TO NODE   1510.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1230.00  DOWNSTREAM(FEET) =    908.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   920.00   CHANNEL SLOPE =  0.3500
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2052 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.26
 FLOW VELOCITY(FEET/SEC) =   2.54 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   6.04   Tc(MIN.) =  13.15
 LONGEST FLOWPATH FROM NODE   1512.00 TO NODE   1510.00 =  1020.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1511.00 TO NODE   1510.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.943
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =     6.70   SUBAREA RUNOFF(CFS) =     8.28
 TOTAL AREA(ACRES) =      6.84   TOTAL RUNOFF(CFS) =    8.45
 TC(MIN.) =  13.15

****************************************************************************
 FLOW PROCESS FROM NODE   1510.00 TO NODE     15.10 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   908.00  DOWNSTREAM(FEET) =   834.00
 FLOW LENGTH(FEET) =   360.00   MANNING'S N =  0.015
 DEPTH OF FLOW IN  24.0 INCH PIPE IS   5.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  17.18
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      8.45
 PIPE TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =  13.50
 LONGEST FLOWPATH FROM NODE   1512.00 TO NODE     15.10 =  1380.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =      6.84  TC(MIN.) =     13.50
 PEAK FLOW RATE(CFS)    =      8.45
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MER16-PD

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
1605	1604	2	1,575.0	1,525.0	112.0	0.30	0.36	
1604	1603	5	1,525.0	1,360.0	280.0			
1604	1603	8				0.35	9.86	
1603	1602	5	1,360.0	1,210.0	570.0			
1603	1602	8				0.33	5.83	
1602	1601	5	1,210.0	950.0	867.0			
1602	1601	8				0.26	11.7	
1601	1601	7						DET OUT Q = 39.34 CFS
1601	16	4	950.0	850.0	605.0			Ex. 42" CSP Caltrans
								Storm Drain
							27.75	Total Area

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

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                          Analysis prepared by:

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                         SAN DIEGO, CALIFORNIA 92122
                              (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 16 - WITH DETENTION ROUTING                                  *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MER16-PD.DAT
  TIME/DATE OF STUDY: 14:04 09/29/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   1605.00 TO NODE   1604.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   112.00
  UPSTREAM ELEVATION(FEET) =   1575.00
  DOWNSTREAM ELEVATION(FEET) =   1525.00
  ELEVATION DIFFERENCE(FEET) =     50.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.684
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
```

```
          THE MAXIMUM OVERLAND FLOW LENGTH =   100.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.647
SUBAREA RUNOFF(CFS) =      0.83
TOTAL AREA(ACRES) =      0.36   TOTAL RUNOFF(CFS) =      0.83

****************************************************************************
 FLOW PROCESS FROM NODE   1604.00 TO NODE   1603.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1525.00  DOWNSTREAM(FEET) =   1360.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   280.00   CHANNEL SLOPE =  0.5893
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2295 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.83
 FLOW VELOCITY(FEET/SEC) =   2.68 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.74   Tc(MIN.) =   8.42
 LONGEST FLOWPATH FROM NODE   1605.00 TO NODE   1603.00 =   392.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1604.00 TO NODE   1603.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.587
 *USER SPECIFIED(SUBAREA):
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3482
 SUBAREA AREA(ACRES) =    9.86   SUBAREA RUNOFF(CFS) =   22.73
 TOTAL AREA(ACRES) =     10.22   TOTAL RUNOFF(CFS) =   23.44
 TC(MIN.) =   8.42

****************************************************************************
 FLOW PROCESS FROM NODE   1603.00 TO NODE   1602.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1360.00  DOWNSTREAM(FEET) =   1210.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   570.00   CHANNEL SLOPE =  0.2632
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1844 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     23.44
 FLOW VELOCITY(FEET/SEC) =   6.87 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.38   Tc(MIN.) =   9.81
 LONGEST FLOWPATH FROM NODE   1605.00 TO NODE   1602.00 =   962.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1603.00 TO NODE   1602.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.972
 *USER SPECIFIED(SUBAREA):
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .3300
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3416
 SUBAREA AREA(ACRES) =    5.83   SUBAREA RUNOFF(CFS) =   11.49
```

```
 TOTAL AREA(ACRES) =     16.05   TOTAL RUNOFF(CFS) =   32.74
 TC(MIN.) =   9.81

****************************************************************************
 FLOW PROCESS FROM NODE   1602.00 TO NODE   1601.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1210.00  DOWNSTREAM(FEET) =    950.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   867.00   CHANNEL SLOPE =  0.2999
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1950 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     32.74
 FLOW VELOCITY(FEET/SEC) =   7.90 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.83   Tc(MIN.) =  11.63
 LONGEST FLOWPATH FROM NODE   1605.00 TO NODE   1601.00 =  1829.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1602.00 TO NODE   1601.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.348
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3072
 SUBAREA AREA(ACRES) =   11.70   SUBAREA RUNOFF(CFS) =   16.27
 TOTAL AREA(ACRES) =     27.75   TOTAL RUNOFF(CFS) =   45.60
 TC(MIN.) =  11.63

****************************************************************************
 FLOW PROCESS FROM NODE   1601.00 TO NODE   1601.00 IS CODE =   7
----------------------------------------------------------------------------
 >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
 USER-SPECIFIED VALUES ARE AS FOLLOWS:
 TC(MIN) =  12.05   RAIN INTENSITY(INCH/HOUR) =  5.23
 TOTAL AREA(ACRES) =    27.75   TOTAL RUNOFF(CFS) =     39.34

****************************************************************************
 FLOW PROCESS FROM NODE   1601.00 TO NODE     16.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   950.00  DOWNSTREAM(FEET) =   850.00
 FLOW LENGTH(FEET) =   605.00   MANNING'S N =  0.015
 DEPTH OF FLOW IN  42.0 INCH PIPE IS   9.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  23.40
 GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     39.34
 PIPE TRAVEL TIME(MIN.) =   0.43    Tc(MIN.) =  12.48
 LONGEST FLOWPATH FROM NODE   1605.00 TO NODE     16.00 =  2434.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =     27.75  TC(MIN.) =     12.48
 PEAK FLOW RATE(CFS)    =     39.34
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR17-P

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
1702	1701.8	2	1,355.0	1,320.0	75.0	0.35	0.11	
1701.8	1701.6	5	1,320.0	1,120.0	325.0			
1701.8	1701.6	8				0.272	1.78	
1701.6	1701	5	1,120.0	950.0	760.0			
1701.6	1701	8				0.26	12.38	
1701	17	4	950.0	900.0	440.0			EX. 30" CSP Caltrans
								Storm Drain
							14.27	Total Area

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

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                          Analysis prepared by:

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                             (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 17                                                           *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MERR17-P.DAT
  TIME/DATE OF STUDY: 15:02 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   1702.00 TO NODE   1701.80 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) =    75.00
  UPSTREAM ELEVATION(FEET) =   1355.00
  DOWNSTREAM ELEVATION(FEET) =   1320.00
  ELEVATION DIFFERENCE(FEET) =     35.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
SUBAREA RUNOFF(CFS) =      0.34
TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.34

****************************************************************************
 FLOW PROCESS FROM NODE   1701.80 TO NODE   1701.60 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1320.00  DOWNSTREAM(FEET) =   1120.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   325.00   CHANNEL SLOPE =  0.6154
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2300 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.34
 FLOW VELOCITY(FEET/SEC) =   2.69 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.02   Tc(MIN.) =   7.44
 LONGEST FLOWPATH FROM NODE   1702.00 TO NODE   1701.60 =   400.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1701.80 TO NODE   1701.60 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.134
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2720
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2765
 SUBAREA AREA(ACRES) =     1.78   SUBAREA RUNOFF(CFS) =     3.45
 TOTAL AREA(ACRES) =      1.89   TOTAL RUNOFF(CFS) =    3.73
 TC(MIN.) =   7.44

****************************************************************************
 FLOW PROCESS FROM NODE   1701.60 TO NODE   1701.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1120.00  DOWNSTREAM(FEET) =    950.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   760.00   CHANNEL SLOPE =  0.2237
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1712 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      3.73
 FLOW VELOCITY(FEET/SEC) =   3.59 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.53   Tc(MIN.) =  10.97
 LONGEST FLOWPATH FROM NODE   1702.00 TO NODE   1701.00 =  1160.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1701.60 TO NODE   1701.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.555
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2622
 SUBAREA AREA(ACRES) =    12.38   SUBAREA RUNOFF(CFS) =   17.88
 TOTAL AREA(ACRES) =     14.27   TOTAL RUNOFF(CFS) =   20.78
 TC(MIN.) =  10.97
```

```
*******************************************************************************
  FLOW PROCESS FROM NODE    1701.00 TO NODE      17.00 IS CODE =  41
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   950.00  DOWNSTREAM(FEET) =   900.00
  FLOW LENGTH(FEET) =   440.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  11.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.56
  GIVEN PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     20.78
  PIPE TRAVEL TIME(MIN.) =   0.58    Tc(MIN.) =  11.55
  LONGEST FLOWPATH FROM NODE   1702.00 TO NODE      17.00 =  1600.00 FEET.
===============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =      14.27  TC(MIN.) =      11.55
  PEAK FLOW RATE(CFS)    =      20.78
===============================================================================
===============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR18-P

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
1802	1801.5	2	1,370.0	1,365.0	88.0	0.29	0.15	
1801.5	1801	5	1,365.0	950.0	970.0			
1801.5	1801	8				0.26	6.35	
1801	18	4	950.0	925.0	440.0			EX. 24" Caltrans
								Storm Drain
							6.5	Total Area

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

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                          Analysis prepared by:

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                              (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 18                                                           *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MERR18-P.DAT
  TIME/DATE OF STUDY: 15:03 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   1802.00 TO NODE   1801.50 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2900
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    88.00
  UPSTREAM ELEVATION(FEET) =   1370.00
  DOWNSTREAM ELEVATION(FEET) =   1365.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.665
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.000
```

```
  SUBAREA RUNOFF(CFS) =      0.30
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.30

****************************************************************************
  FLOW PROCESS FROM NODE    1801.50 TO NODE    1801.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1365.00  DOWNSTREAM(FEET) =    950.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   970.00   CHANNEL SLOPE =  0.4278
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2173 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.30
  FLOW VELOCITY(FEET/SEC) =   2.61 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   6.19   Tc(MIN.) =  13.86
  LONGEST FLOWPATH FROM NODE   1802.00 TO NODE   1801.00 =  1058.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    1801.50 TO NODE    1801.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.778
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2607
  SUBAREA AREA(ACRES) =     6.35   SUBAREA RUNOFF(CFS) =     7.89
  TOTAL AREA(ACRES) =      6.50   TOTAL RUNOFF(CFS) =    8.10
  TC(MIN.) =  13.86

****************************************************************************
  FLOW PROCESS FROM NODE    1801.00 TO NODE      18.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   950.00  DOWNSTREAM(FEET) =   925.00
  FLOW LENGTH(FEET) =   440.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   6.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.87
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      8.10
  PIPE TRAVEL TIME(MIN.) =   0.62    Tc(MIN.) =  14.48
  LONGEST FLOWPATH FROM NODE   1802.00 TO NODE     18.00 =  1498.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =      6.50  TC(MIN.) =     14.48
  PEAK FLOW RATE(CFS)    =      8.10
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Job #:
2469.01A

Date:
March 2007

Run Name:
MM19PDVD

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Land Use	Runoff Coeff.	Area (ac.)	Comments
1961	1960	2	1,364.0	1,362.0	100.0	8	0.81	0.09	
1960	1942	6	1,362.0	1,335.0	850.0	8	0.817	5.64	
1950	1942	8				8	0.82	3.49	
1942	1942	1							1 of 2
1945	1944	2	1,585.0	1,550.0	100.0	21	0.35	0.25	
1944	1943	5	1,550.0	1,400.0	410.0				
1944	1943	8				21	0.35	2.87	
1943	1942	3	1,400.0	1,330.0	130.0				
1942	1942	1							2 of 2
1942	1940	3	1,330.0	1,290.0	693.0				
1942	1940	8				8	0.82	4.02	
1941	1940	8				8	0.815	2.65	
1940	1940	1							1 of 2
1908	1907	2	1,335.0	1,327.0	100.0	8	0.85	0.41	
1907	1940	6	1,327.0	1,295.0	405.0	8	0.85	1.84	
1940	1940	1							2 of 2
1940	1930	3	1,290.0	1,260.0	335.0				
1940	1930	8				8	0.85	1.22	
1931	1930	8				8	0.815	6.02	
1932	1930	8				17	0.549	2.55	
1930	1920	3	1,260.0	1,195.0	660.0				
1930	1920	8				8	0.849	2.48	
1920	1920	1							1 of 2
1927	1926	2	1,397.0	1,395.0	100.0	8	0.82	0.16	
1926	1925	6	1,395.0	1,380.0	380.0	8	0.82	4.27	
1925	1924	6	1,380.0	1,340.0	475.0	8	0.819	2.75	
1924	1923	3	1,335.0	1,240.0	1,101.0				
1924	1923	8				8	0.818	5.02	
1923	1920	3	1,240.0	1,195.0	966.0				
1922	1920	8				8	0.814	7.07	
1921	1920	8				8	0.804	4.18	
1920	1920	1							2 of 2
1920	1910	3	1,195.0	1,140.0	460.0				
1920	1910	8				8	0.842	1.46	
1910	1910	1							1 of 2
1914	1913	2	1,197.0	1,195.0	100.0	8	0.8	0.22	
1913	1911	6	1,195.0	1,180.0	935.0	8	0.814	5.85	
1912	1911	8				8	0.79	4.06	
1911	1910	3	1,175.0	1,140.0	910.0				
1911	1910	8				8	0.802	7.04	

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Job Name:
Merriam Proposed Hydrology

Job #:
2469.01A

Date:
March 2007

Run Name:
MM19PDVD

Node to Node		Code	Elev 1 (feet)		Length (feet)	Land Use	Runoff Coeff.	Area (ac.)	Comments
1910	1910	1							2 of 2
1910	1902	3	1,140.0	1,065.0	175.0				
1902	1901	3	1,065.0	1,025.0	1,020.0				
1902	1901	8				21	0.252	9.77	
1901	1900	5	1,025.0	940.0	475.0				
1901	1900	8				21	0.27	7.11	
1900	1900	1							1 of 2
1999	1900	7							DIVERTED FLOW INPUT
1900	1900	1							2 of 2
1900	1900	7							DET OUT Q = 82.26 CFS
1900	19	4	940.0	931.0	459.0				Ex. 60" RCP Caltrans
									Storm Drain
								122.82	Total Area

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

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2004 Advanced Engineering Software (aes)
              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

                           Fuscoe Engineering, San Diego
                            6390 Greenwich Dr. Suite 170
                                San Diego, CA 92122
                                   858-554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 19 - WITH DIVERSION FROM SUBBASIN # 20 AND 30" RESTRICTOR    *
* 2469.01A - MARCH 2007                                                  *
 **************************************************************************

  FILE NAME: MM19PDVD.DAT
  TIME/DATE OF STUDY: 10:48 03/22/2007
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   1961.00 TO NODE   1960.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1364.00
  DOWNSTREAM ELEVATION(FEET) =   1362.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.588
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
```

```
          THE MAXIMUM OVERLAND FLOW LENGTH =    75.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) =      0.67
TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.67

****************************************************************************
 FLOW PROCESS FROM NODE   1960.00 TO NODE   1942.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1362.00  DOWNSTREAM ELEVATION(FEET) = 1335.00
 STREET LENGTH(FEET) =   850.00   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) =   0.0500
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.12
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.51
   HALFSTREET FLOOD WIDTH(FEET) =   18.62
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.84
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.94
 STREET FLOW TRAVEL TIME(MIN.) =   7.69   Tc(MIN.) =  11.28
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.456
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8170
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.817
 SUBAREA AREA(ACRES) =     5.64      SUBAREA RUNOFF(CFS) =   25.14
 TOTAL AREA(ACRES) =      5.73        PEAK FLOW RATE(CFS) =      25.54

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.60   HALFSTREET FLOOD WIDTH(FEET) =  22.84
 FLOW VELOCITY(FEET/SEC.) =  2.29   DEPTH*VELOCITY(FT*FT/SEC.) =   1.37
 LONGEST FLOWPATH FROM NODE   1961.00 TO NODE   1942.00 =   950.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1950.00 TO NODE   1942.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.456
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8200
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.8181
 SUBAREA AREA(ACRES) =     3.49   SUBAREA RUNOFF(CFS) =   15.62
 TOTAL AREA(ACRES) =      9.22   TOTAL RUNOFF(CFS) =   41.16
 TC(MIN.) =  11.28

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

```
 FLOW PROCESS FROM NODE    1942.00 TO NODE    1942.00 IS CODE =    1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  11.28
 RAINFALL INTENSITY(INCH/HR) =   5.46
 TOTAL STREAM AREA(ACRES) =     9.22
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     41.16

****************************************************************************
 FLOW PROCESS FROM NODE    1945.00 TO NODE    1944.00 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) =   1585.00
 DOWNSTREAM ELEVATION(FEET) =   1550.00
 ELEVATION DIFFERENCE(FEET) =     35.00
 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) =  7.972
 SUBAREA RUNOFF(CFS) =      0.70
 TOTAL AREA(ACRES) =      0.25   TOTAL RUNOFF(CFS) =      0.70

****************************************************************************
 FLOW PROCESS FROM NODE    1944.00 TO NODE    1943.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1550.00  DOWNSTREAM(FEET) =   1400.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   410.00   CHANNEL SLOPE =  0.3659
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2080 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.70
 FLOW VELOCITY(FEET/SEC) =   2.55 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.68   Tc(MIN.) =   8.94
 LONGEST FLOWPATH FROM NODE   1945.00 TO NODE   1943.00 =   510.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    1944.00 TO NODE    1943.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.338
 *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) =    2.87   SUBAREA RUNOFF(CFS) =    6.37
 TOTAL AREA(ACRES) =      3.12   TOTAL RUNOFF(CFS) =    6.92
 TC(MIN.) =   8.94

****************************************************************************
 FLOW PROCESS FROM NODE    1943.00 TO NODE    1942.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1400.00  DOWNSTREAM(FEET) =  1330.00
  FLOW LENGTH(FEET) =   130.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  26.04
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      6.92
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =   9.03
  LONGEST FLOWPATH FROM NODE   1945.00 TO NODE   1942.00 =   640.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1942.00 TO NODE   1942.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   9.03
  RAINFALL INTENSITY(INCH/HR) =   6.30
  TOTAL STREAM AREA(ACRES) =     3.12
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.92

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc       INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1       41.16    11.28        5.456          9.22
      2        6.92     9.03        6.300          3.12

  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       39.85     9.03       6.300
      2       47.15    11.28       5.456

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     47.15   Tc(MIN.) =   11.28
  TOTAL AREA(ACRES) =     12.34
  LONGEST FLOWPATH FROM NODE   1961.00 TO NODE   1942.00 =   950.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1942.00 TO NODE   1940.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1330.00  DOWNSTREAM(FEET) =  1290.00
  FLOW LENGTH(FEET) =   693.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  18.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.61
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     47.15
  PIPE TRAVEL TIME(MIN.) =   0.62    Tc(MIN.) =  11.90
  LONGEST FLOWPATH FROM NODE   1961.00 TO NODE   1940.00 =  1643.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1942.00 TO NODE   1940.00 IS CODE =  81
----------------------------------------------------------------------------
```

```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.271
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7293
  SUBAREA AREA(ACRES) =    4.02   SUBAREA RUNOFF(CFS) =   17.38
  TOTAL AREA(ACRES) =     16.36   TOTAL RUNOFF(CFS) =   62.89
  TC(MIN.) =  11.90

****************************************************************************
  FLOW PROCESS FROM NODE   1941.00 TO NODE   1940.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.271
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7419
  SUBAREA AREA(ACRES) =    2.65   SUBAREA RUNOFF(CFS) =   11.45
  TOTAL AREA(ACRES) =     19.01   TOTAL RUNOFF(CFS) =   74.34
  TC(MIN.) =  11.90

****************************************************************************
  FLOW PROCESS FROM NODE   1940.00 TO NODE   1940.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  11.90
  RAINFALL INTENSITY(INCH/HR) =   5.27
  TOTAL STREAM AREA(ACRES) =    19.01
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     74.34

****************************************************************************
  FLOW PROCESS FROM NODE   1908.00 TO NODE   1907.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (24. DU/AC OR LESS) 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) =   1327.00
  ELEVATION DIFFERENCE(FEET) =      8.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.228
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    98.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      3.21
  TOTAL AREA(ACRES) =      0.41   TOTAL RUNOFF(CFS) =      3.21

****************************************************************************
  FLOW PROCESS FROM NODE   1907.00 TO NODE   1940.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1327.00  DOWNSTREAM ELEVATION(FEET) = 1295.00
  STREET LENGTH(FEET) =   405.00   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) =   0.0500
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.32
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.42
    HALFSTREET FLOOD WIDTH(FEET) =   14.45
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.34
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.97
  STREET FLOW TRAVEL TIME(MIN.) =   2.88   Tc(MIN.) =   5.11
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.091
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
  SUBAREA AREA(ACRES) =    1.84      SUBAREA RUNOFF(CFS) =   14.22
  TOTAL AREA(ACRES) =      2.25        PEAK FLOW RATE(CFS) =      17.39

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.48   HALFSTREET FLOOD WIDTH(FEET) =  17.75
  FLOW VELOCITY(FEET/SEC.) =  2.66   DEPTH*VELOCITY(FT*FT/SEC.) =   1.28
  LONGEST FLOWPATH FROM NODE   1908.00 TO NODE   1940.00 =   505.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1940.00 TO NODE   1940.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   5.11
  RAINFALL INTENSITY(INCH/HR) =   9.09
  TOTAL STREAM AREA(ACRES) =     2.25
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     17.39

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc       INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1       74.34    11.90        5.271         19.01
      2       17.39     5.11        9.091          2.25

  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       60.49     5.11        9.091
      2       84.42    11.90        5.271
```

```
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     84.42   Tc(MIN.) =   11.90
 TOTAL AREA(ACRES) =     21.26
 LONGEST FLOWPATH FROM NODE   1961.00 TO NODE   1940.00 =  1643.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1940.00 TO NODE   1930.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1290.00  DOWNSTREAM(FEET) =  1260.00
 FLOW LENGTH(FEET) =   335.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  21.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  25.18
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     84.42
 PIPE TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =  12.12
 LONGEST FLOWPATH FROM NODE   1961.00 TO NODE   1930.00 =  1978.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1940.00 TO NODE   1930.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.209
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7586
 SUBAREA AREA(ACRES) =    1.22   SUBAREA RUNOFF(CFS) =    5.40
 TOTAL AREA(ACRES) =     22.48   TOTAL RUNOFF(CFS) =   88.83
 TC(MIN.) =  12.12

****************************************************************************
 FLOW PROCESS FROM NODE   1931.00 TO NODE   1930.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.209
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8150
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7705
 SUBAREA AREA(ACRES) =    6.02   SUBAREA RUNOFF(CFS) =   25.56
 TOTAL AREA(ACRES) =     28.50   TOTAL RUNOFF(CFS) =  114.38
 TC(MIN.) =  12.12

****************************************************************************
 FLOW PROCESS FROM NODE   1932.00 TO NODE   1930.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.209
 *USER SPECIFIED(SUBAREA):
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .5490
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7523
 SUBAREA AREA(ACRES) =    2.55   SUBAREA RUNOFF(CFS) =    7.29
 TOTAL AREA(ACRES) =     31.05   TOTAL RUNOFF(CFS) =  121.67
 TC(MIN.) =  12.12

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

```
 FLOW PROCESS FROM NODE   1930.00 TO NODE   1920.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1260.00  DOWNSTREAM(FEET) =  1195.00
 FLOW LENGTH(FEET) =   660.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  30.0 INCH PIPE IS  24.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  28.36
 ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    121.67
 PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =  12.51
 LONGEST FLOWPATH FROM NODE   1961.00 TO NODE   1920.00 =  2638.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1930.00 TO NODE   1920.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.104
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8490
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7595
 SUBAREA AREA(ACRES) =    2.48   SUBAREA RUNOFF(CFS) =   10.75
 TOTAL AREA(ACRES) =     33.53   TOTAL RUNOFF(CFS) =  129.97
 TC(MIN.) =  12.51

****************************************************************************
 FLOW PROCESS FROM NODE   1920.00 TO NODE   1920.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  12.51
 RAINFALL INTENSITY(INCH/HR) =   5.10
 TOTAL STREAM AREA(ACRES) =    33.53
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    129.97

****************************************************************************
 FLOW PROCESS FROM NODE   1927.00 TO NODE   1926.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8200
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1397.00
 DOWNSTREAM ELEVATION(FEET) =   1395.00
 ELEVATION DIFFERENCE(FEET) =      2.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.464
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    75.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      1.21
 TOTAL AREA(ACRES) =      0.16   TOTAL RUNOFF(CFS) =      1.21

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

```
 FLOW PROCESS FROM NODE   1926.00 TO NODE   1925.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1395.00  DOWNSTREAM ELEVATION(FEET) = 1380.00
 STREET LENGTH(FEET) =   380.00   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) =   0.0500
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.93
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.51
   HALFSTREET FLOOD WIDTH(FEET) =   18.26
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.02
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.02
 STREET FLOW TRAVEL TIME(MIN.) =   3.14   Tc(MIN.) =   6.60
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.708
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8200
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.820
 SUBAREA AREA(ACRES) =     4.27      SUBAREA RUNOFF(CFS) =   26.99
 TOTAL AREA(ACRES) =       4.43        PEAK FLOW RATE(CFS) =      28.00

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.59   HALFSTREET FLOOD WIDTH(FEET) =  22.71
 FLOW VELOCITY(FEET/SEC.) =  2.53   DEPTH*VELOCITY(FT*FT/SEC.) =   1.51
 LONGEST FLOWPATH FROM NODE   1927.00 TO NODE   1925.00 =   480.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1925.00 TO NODE   1924.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1380.00  DOWNSTREAM ELEVATION(FEET) = 1340.00
 STREET LENGTH(FEET) =   475.00   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) =   0.0500
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      35.20
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.57
   HALFSTREET FLOOD WIDTH(FEET) =   21.55
```

```
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.51
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.01
 STREET FLOW TRAVEL TIME(MIN.) =   2.25   Tc(MIN.) =   8.86
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.378
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8190
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.820
 SUBAREA AREA(ACRES) =     2.75      SUBAREA RUNOFF(CFS) =   14.36
 TOTAL AREA(ACRES) =       7.18        PEAK FLOW RATE(CFS) =      37.53

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.58   HALFSTREET FLOOD WIDTH(FEET) =  22.04
 FLOW VELOCITY(FEET/SEC.) =  3.59   DEPTH*VELOCITY(FT*FT/SEC.) =   2.09
 LONGEST FLOWPATH FROM NODE   1927.00 TO NODE   1924.00 =   955.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1924.00 TO NODE   1923.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1335.00  DOWNSTREAM(FEET) =  1240.00
 FLOW LENGTH(FEET) =  1101.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  20.61
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     37.53
 PIPE TRAVEL TIME(MIN.) =   0.89    Tc(MIN.) =   9.75
 LONGEST FLOWPATH FROM NODE   1927.00 TO NODE   1923.00 =  2056.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1924.00 TO NODE   1923.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.995
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8140
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.8173
 SUBAREA AREA(ACRES) =     5.02   SUBAREA RUNOFF(CFS) =   24.50
 TOTAL AREA(ACRES) =      12.20   TOTAL RUNOFF(CFS) =   59.78
 TC(MIN.) =   9.75

****************************************************************************
 FLOW PROCESS FROM NODE   1923.00 TO NODE   1920.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1240.00  DOWNSTREAM(FEET) =  1195.00
 FLOW LENGTH(FEET) =   966.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  18.14
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     59.78
 PIPE TRAVEL TIME(MIN.) =   0.89    Tc(MIN.) =  10.63
 LONGEST FLOWPATH FROM NODE   1927.00 TO NODE   1920.00 =  3022.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1922.00 TO NODE   1920.00 IS CODE =  81
----------------------------------------------------------------------------
```

```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.668
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8140
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8161
  SUBAREA AREA(ACRES) =    7.07   SUBAREA RUNOFF(CFS) =   32.62
  TOTAL AREA(ACRES) =     19.27   TOTAL RUNOFF(CFS) =   89.13
  TC(MIN.) =  10.63

****************************************************************************
  FLOW PROCESS FROM NODE   1921.00 TO NODE   1920.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.668
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8040
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8139
  SUBAREA AREA(ACRES) =    4.18   SUBAREA RUNOFF(CFS) =   19.05
  TOTAL AREA(ACRES) =     23.45   TOTAL RUNOFF(CFS) =  108.18
  TC(MIN.) =  10.63

****************************************************************************
  FLOW PROCESS FROM NODE   1920.00 TO NODE   1920.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  10.63
  RAINFALL INTENSITY(INCH/HR) =   5.67
  TOTAL STREAM AREA(ACRES) =    23.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    108.18

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc       INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1      129.97    12.51        5.104         33.53
      2      108.18    10.63        5.668         23.45

  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      225.22    10.63        5.668
      2      227.39    12.51        5.104

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    227.39   Tc(MIN.) =   12.51
  TOTAL AREA(ACRES) =     56.98
  LONGEST FLOWPATH FROM NODE   1927.00 TO NODE   1920.00 =  3022.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1920.00 TO NODE   1910.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1195.00  DOWNSTREAM(FEET) =  1140.00
  FLOW LENGTH(FEET) =   460.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  36.58
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    227.39
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =  12.72
  LONGEST FLOWPATH FROM NODE   1927.00 TO NODE   1910.00 =  3482.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1920.00 TO NODE   1910.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.050
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8420
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7834
  SUBAREA AREA(ACRES) =    1.46   SUBAREA RUNOFF(CFS) =    6.21
  TOTAL AREA(ACRES) =     58.44   TOTAL RUNOFF(CFS) =  231.18
  TC(MIN.) =  12.72

****************************************************************************
  FLOW PROCESS FROM NODE   1910.00 TO NODE   1910.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  12.72
  RAINFALL INTENSITY(INCH/HR) =   5.05
  TOTAL STREAM AREA(ACRES) =    58.44
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    231.18

****************************************************************************
  FLOW PROCESS FROM NODE   1914.00 TO NODE   1913.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1197.00
  DOWNSTREAM ELEVATION(FEET) =   1195.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.712
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    75.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.62
  TOTAL AREA(ACRES) =      0.22   TOTAL RUNOFF(CFS) =      1.62

****************************************************************************
  FLOW PROCESS FROM NODE   1913.00 TO NODE   1911.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
```

```
==========================================================================
  UPSTREAM ELEVATION(FEET) = 1195.00  DOWNSTREAM ELEVATION(FEET) = 1180.00
  STREET LENGTH(FEET) =   935.00   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) =   0.0500
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.78
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.56
    HALFSTREET FLOOD WIDTH(FEET) =   20.76
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.47
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.82
  STREET FLOW TRAVEL TIME(MIN.) =  10.57   Tc(MIN.) =  14.29
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.685
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8140
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.813
  SUBAREA AREA(ACRES) =     5.85      SUBAREA RUNOFF(CFS) =   22.31
  TOTAL AREA(ACRES) =       6.07        PEAK FLOW RATE(CFS) =      23.14

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.64   HALFSTREET FLOOD WIDTH(FEET) =  24.85
  FLOW VELOCITY(FEET/SEC.) =  1.77   DEPTH*VELOCITY(FT*FT/SEC.) =   1.13
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  935.0 FT WITH ELEVATION-DROP =  15.0 FT, IS   43.9 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   1911.00
  LONGEST FLOWPATH FROM NODE   1914.00 TO NODE   1911.00 =  1035.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1912.00 TO NODE   1911.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.685
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8041
  SUBAREA AREA(ACRES) =     4.06   SUBAREA RUNOFF(CFS) =   15.03
  TOTAL AREA(ACRES) =      10.13   TOTAL RUNOFF(CFS) =   38.16
  TC(MIN.) =  14.29

****************************************************************************
  FLOW PROCESS FROM NODE   1911.00 TO NODE   1910.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1175.00  DOWNSTREAM(FEET) =  1140.00
  FLOW LENGTH(FEET) =   910.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  17.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.17
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
```

```
 PIPE-FLOW(CFS) =     38.16
 PIPE TRAVEL TIME(MIN.) =   1.00    Tc(MIN.) =  15.28
 LONGEST FLOWPATH FROM NODE   1914.00 TO NODE   1910.00 =  1945.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1911.00 TO NODE   1910.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.485
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8020
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.8032
 SUBAREA AREA(ACRES) =    7.04   SUBAREA RUNOFF(CFS) =   25.32
 TOTAL AREA(ACRES) =     17.17   TOTAL RUNOFF(CFS) =   61.86
 TC(MIN.) =  15.28

****************************************************************************
 FLOW PROCESS FROM NODE   1910.00 TO NODE   1910.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  15.28
 RAINFALL INTENSITY(INCH/HR) =   4.49
 TOTAL STREAM AREA(ACRES) =    17.17
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     61.86

 ** CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY      AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
    1      231.18    12.72        5.050         58.44
    2       61.86    15.28        4.485         17.17

 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      282.65    12.72        5.050
    2      267.20    15.28        4.485

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    282.65   Tc(MIN.) =   12.72
 TOTAL AREA(ACRES) =     75.61
 LONGEST FLOWPATH FROM NODE   1927.00 TO NODE   1910.00 =  3482.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1910.00 TO NODE   1902.00 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) =  1065.00
 FLOW LENGTH(FEET) =   175.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  33.0 INCH PIPE IS  23.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  62.19
 ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    282.65
```

```
 PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =  12.77
 LONGEST FLOWPATH FROM NODE   1927.00 TO NODE   1902.00 =  3657.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1902.00 TO NODE   1901.00 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) =  1025.00
 FLOW LENGTH(FEET) =  1020.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  51.0 INCH PIPE IS  37.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  25.27
 ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    282.65
 PIPE TRAVEL TIME(MIN.) =   0.67    Tc(MIN.) =  13.44
 LONGEST FLOWPATH FROM NODE   1927.00 TO NODE   1901.00 =  4677.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1902.00 TO NODE   1901.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.873
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2520
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7266
 SUBAREA AREA(ACRES) =    9.77   SUBAREA RUNOFF(CFS) =   12.00
 TOTAL AREA(ACRES) =     85.38   TOTAL RUNOFF(CFS) =  302.32
 TC(MIN.) =  13.44

****************************************************************************
 FLOW PROCESS FROM NODE   1901.00 TO NODE   1900.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1025.00  DOWNSTREAM(FEET) =    940.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   475.00   CHANNEL SLOPE =  0.1789
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1495 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =    302.32
 FLOW VELOCITY(FEET/SEC) =  14.50 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   0.55   Tc(MIN.) =  13.99
 LONGEST FLOWPATH FROM NODE   1927.00 TO NODE   1900.00 =  5152.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1901.00 TO NODE   1900.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.750
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .5000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7092
 SUBAREA AREA(ACRES) =    7.11   SUBAREA RUNOFF(CFS) =   16.89
 TOTAL AREA(ACRES) =     92.49   TOTAL RUNOFF(CFS) =  311.55
 TC(MIN.) =  13.99

****************************************************************************
 FLOW PROCESS FROM NODE   1900.00 TO NODE   1900.00 IS CODE =   1
```

```
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  13.99
  RAINFALL INTENSITY(INCH/HR) =   4.75
  TOTAL STREAM AREA(ACRES) =    92.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    311.55

****************************************************************************
  FLOW PROCESS FROM NODE   1999.00 TO NODE   1900.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  10.69   RAIN INTENSITY(INCH/HOUR) =  5.65
  TOTAL AREA(ACRES) =    30.33   TOTAL RUNOFF(CFS) =    138.06

****************************************************************************
  FLOW PROCESS FROM NODE   1900.00 TO NODE   1900.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  10.69
  RAINFALL INTENSITY(INCH/HR) =   5.65
  TOTAL STREAM AREA(ACRES) =    30.33
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    138.06

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1      311.55    13.99        4.750         92.49
      2      138.06    10.69        5.649         30.33

  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      400.03    10.69        5.649
      2      427.64    13.99        4.750

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    427.64   Tc(MIN.) =   13.99
  TOTAL AREA(ACRES) =    122.82
  LONGEST FLOWPATH FROM NODE   1927.00 TO NODE   1900.00 =  5152.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1900.00 TO NODE   1900.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  13.99   RAIN INTENSITY(INCH/HOUR) =  4.75
  TOTAL AREA(ACRES) =   122.82   TOTAL RUNOFF(CFS) =     82.26

****************************************************************************
  FLOW PROCESS FROM NODE   1900.00 TO NODE     19.00 IS CODE =  41
```

```
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   940.00  DOWNSTREAM(FEET) =   931.00
  FLOW LENGTH(FEET) =   459.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  60.0 INCH PIPE IS  19.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.44
  GIVEN PIPE DIAMETER(INCH) =  60.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     82.26
  PIPE TRAVEL TIME(MIN.) =   0.53    Tc(MIN.) =  14.52
  LONGEST FLOWPATH FROM NODE   1927.00 TO NODE     19.00 =  5611.00 FEET.
==============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    122.82  TC(MIN.) =     14.52
  PEAK FLOW RATE(CFS)   =     82.26
==============================================================================
==============================================================================
  END OF RATIONAL METHOD ANALYSIS

```

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Job Name: Merriam Mountains - Proposed Hydrology

Date: March 2007

Job #: 2469.01A

Run Name: MM20PDIV

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2033	2032	2	1,072.0	1,071.0	100.0	0.82	0.68	
2032	2031	3	1,063.0	1,055.0	428.0			24" RCP
2031	2025	5	1,055.0	995.0	410.0			
2025	2025	10						Memory Bank #1
2022	2021	2	1,160.0	1,140.0	100.0	0.80	0.3	
2021	2020	6	1,140.0	1,100.0	420.0	0.80	3.4	
2020	2001	3	1,095.0	1,065.0	615.0			
2020	2001	8				0.81	4.6	
2001	2001	1						1 of 2
2012	2011	2	1,080.0	1,078.0	100.0	0.80	0.19	
2011	2010	5	1,078.0	1,073.0	450.0			
2011	2010	8				0.80	4.21	
2010	2001	3	1,069.0	1,065.0	575.0			
2010	2001	8				0.81	11.29	
2001	2001	1						2 of 2
2001	2025	3	1,065.0	995.0	560.0			
2025	2025	8				0.80	1.89	
2025	2025	11						Confluence Mem Bank #1
2025	2025	12						Delete Mem Bank #1
2025	2024	5	995.0	975.0	400.0			
2025	2024	8				0.80	1.89	
2024	1999	5	975.0	950.0	270.0			
2024	1999	8				0.80	1.88	Send Results to basin 19 as user specified
							30.33	Total Area

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

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                       2003,1985,1981 HYDROLOGY MANUAL
        (c) Copyright 1982-2004 Advanced Engineering Software (aes)
            Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                          Analysis prepared by:

                        Fuscoe Engineering, San Diego
                         6390 Greenwich Dr. Suite 170
                             San Diego, CA 92122
                                858-554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 20 - WITH DIVERSION TO SUBBASIN # 19                         *
* 2469.01A - MARCH 2007                                                  *
 **************************************************************************

  FILE NAME: MM20PDIV.DAT
  TIME/DATE OF STUDY: 08:42 03/22/2007
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   2033.00 TO NODE   2032.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1072.00
  DOWNSTREAM ELEVATION(FEET) =   1071.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.217
  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) =  9.222
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) =      5.14
TOTAL AREA(ACRES) =      0.68   TOTAL RUNOFF(CFS) =      5.14

****************************************************************************
FLOW PROCESS FROM NODE   2032.00 TO NODE   2031.00 IS CODE =  41
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =  1063.00  DOWNSTREAM(FEET) =  1055.00
FLOW LENGTH(FEET) =   428.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  24.0 INCH PIPE IS   6.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =   7.02
GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =      5.14
PIPE TRAVEL TIME(MIN.) =   1.02    Tc(MIN.) =   5.23
LONGEST FLOWPATH FROM NODE   2033.00 TO NODE   2031.00 =   528.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   2031.00 TO NODE   2025.00 IS CODE =  52
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1055.00  DOWNSTREAM(FEET) =    995.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   410.00   CHANNEL SLOPE =  0.1463
NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) =      5.14
FLOW VELOCITY(FEET/SEC) =   6.72 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   1.02   Tc(MIN.) =   6.25
LONGEST FLOWPATH FROM NODE   2033.00 TO NODE   2025.00 =   938.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   2025.00 TO NODE   2025.00 IS CODE =  10
----------------------------------------------------------------------------
>>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
FLOW PROCESS FROM NODE   2022.00 TO NODE   2021.00 IS CODE =  21
----------------------------------------------------------------------------
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
*USER SPECIFIED(SUBAREA):
RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8000
S.C.S. CURVE NUMBER (AMC II) =   0
INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
UPSTREAM ELEVATION(FEET) =   1160.00
DOWNSTREAM ELEVATION(FEET) =   1140.00
ELEVATION DIFFERENCE(FEET) =     20.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.507
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) =      2.21
TOTAL AREA(ACRES) =      0.30   TOTAL RUNOFF(CFS) =      2.21

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

```
 FLOW PROCESS FROM NODE    2021.00 TO NODE    2020.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1140.00  DOWNSTREAM ELEVATION(FEET) = 1100.00
 STREET LENGTH(FEET) =   420.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 16.00

 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(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.75
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.32
   HALFSTREET FLOOD WIDTH(FEET) =    9.77
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.88
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.21
 STREET FLOW TRAVEL TIME(MIN.) =   1.02   Tc(MIN.) =   3.52
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.800
 SUBAREA AREA(ACRES) =    3.40      SUBAREA RUNOFF(CFS) =   25.08
 TOTAL AREA(ACRES) =      3.70        PEAK FLOW RATE(CFS) =      27.30

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) =  12.69
 FLOW VELOCITY(FEET/SEC.) =  7.89   DEPTH*VELOCITY(FT*FT/SEC.) =   3.00
 LONGEST FLOWPATH FROM NODE   2022.00 TO NODE   2020.00 =   520.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    2020.00 TO NODE    2001.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1095.00  DOWNSTREAM(FEET) =  1065.00
 FLOW LENGTH(FEET) =   615.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  15.41
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     27.30
 PIPE TRAVEL TIME(MIN.) =   0.67    Tc(MIN.) =   4.19
 LONGEST FLOWPATH FROM NODE   2022.00 TO NODE   2001.00 =  1135.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    2020.00 TO NODE    2001.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8100
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8055
  SUBAREA AREA(ACRES) =     4.60   SUBAREA RUNOFF(CFS) =   34.36
  TOTAL AREA(ACRES) =       8.30   TOTAL RUNOFF(CFS) =   61.66
  TC(MIN.) =   4.19

****************************************************************************
  FLOW PROCESS FROM NODE   2001.00 TO NODE   2001.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   4.19
  RAINFALL INTENSITY(INCH/HR) =   9.22
  TOTAL STREAM AREA(ACRES) =     8.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     61.66

****************************************************************************
  FLOW PROCESS FROM NODE   2012.00 TO NODE   2011.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1080.00
  DOWNSTREAM ELEVATION(FEET) =   1078.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.712
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    75.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.40
  TOTAL AREA(ACRES) =      0.19   TOTAL RUNOFF(CFS) =      1.40

****************************************************************************
  FLOW PROCESS FROM NODE   2011.00 TO NODE   2010.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1078.00  DOWNSTREAM(FEET) =   1073.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   450.00   CHANNEL SLOPE =  0.0111
  CHANNEL FLOW THRU SUBAREA(CFS) =      1.40
  FLOW VELOCITY(FEET/SEC) =   1.69 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.44   Tc(MIN.) =   8.16
  LONGEST FLOWPATH FROM NODE   2012.00 TO NODE   2010.00 =   550.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2011.00 TO NODE   2010.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.726
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8000
```

```
  SUBAREA AREA(ACRES) =     4.21   SUBAREA RUNOFF(CFS) =   22.65
  TOTAL AREA(ACRES) =       4.40   TOTAL RUNOFF(CFS) =   23.67
  TC(MIN.) =   8.16

****************************************************************************
  FLOW PROCESS FROM NODE   2010.00 TO NODE   2001.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1069.00  DOWNSTREAM(FEET) =  1065.00
  FLOW LENGTH(FEET) =   575.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  21.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.02
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     23.67
  PIPE TRAVEL TIME(MIN.) =   1.37    Tc(MIN.) =   9.52
  LONGEST FLOWPATH FROM NODE   2012.00 TO NODE   2001.00 =  1125.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2010.00 TO NODE   2001.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.087
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8072
  SUBAREA AREA(ACRES) =   11.29   SUBAREA RUNOFF(CFS) =   55.66
  TOTAL AREA(ACRES) =     15.69   TOTAL RUNOFF(CFS) =   77.09
  TC(MIN.) =   9.52

****************************************************************************
  FLOW PROCESS FROM NODE   2001.00 TO NODE   2001.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   9.52
  RAINFALL INTENSITY(INCH/HR) =   6.09
  TOTAL STREAM AREA(ACRES) =    15.69
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     77.09

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
      1       61.66     4.19        9.222         8.30
      2       77.09     9.52        6.087        15.69

  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       95.58     4.19        9.222
      2      117.78     9.52        6.087

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    117.78   Tc(MIN.) =    9.52
```

```
 TOTAL AREA(ACRES) =     23.99
 LONGEST FLOWPATH FROM NODE   2022.00 TO NODE   2001.00 =  1135.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2001.00 TO NODE   2025.00 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) =   995.00
 FLOW LENGTH(FEET) =   560.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  30.0 INCH PIPE IS  21.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  31.49
 ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    117.78
 PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =   9.82
 LONGEST FLOWPATH FROM NODE   2022.00 TO NODE   2025.00 =  1695.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2025.00 TO NODE   2025.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.968
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.8061
 SUBAREA AREA(ACRES) =    1.89   SUBAREA RUNOFF(CFS) =    9.02
 TOTAL AREA(ACRES) =     25.88   TOTAL RUNOFF(CFS) =  124.50
 TC(MIN.) =   9.82

****************************************************************************
 FLOW PROCESS FROM NODE   2025.00 TO NODE   2025.00 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       124.50      9.82        5.968        25.88
 LONGEST FLOWPATH FROM NODE   2022.00 TO NODE   2025.00 =  1695.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc       INTENSITY      AREA
 NUMBER      (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
    1         5.14      6.25        7.985         0.68
 LONGEST FLOWPATH FROM NODE   2033.00 TO NODE   2025.00 =   938.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF        Tc       INTENSITY
 NUMBER     (CFS)      (MIN.)    (INCH/HOUR)
    1       84.41        6.25         7.985
    2      128.34        9.82         5.968

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    128.34   Tc(MIN.) =    9.82
 TOTAL AREA(ACRES) =     26.56

****************************************************************************
 FLOW PROCESS FROM NODE   2025.00 TO NODE   2025.00 IS CODE =  12
----------------------------------------------------------------------------
```

```
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
================================================================================

********************************************************************************
 FLOW PROCESS FROM NODE    2025.00 TO NODE    2024.00 IS CODE =  52
--------------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     995.00  DOWNSTREAM(FEET) =     975.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   400.00   CHANNEL SLOPE =  0.0500
 CHANNEL FLOW THRU SUBAREA(CFS) =     128.34
 FLOW VELOCITY(FEET/SEC) =  11.44 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =    0.58   Tc(MIN.) =  10.40
 LONGEST FLOWPATH FROM NODE    2022.00 TO NODE    2024.00 =  2095.00 FEET.

********************************************************************************
 FLOW PROCESS FROM NODE    2025.00 TO NODE    2024.00 IS CODE =  81
--------------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.750
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.8061
 SUBAREA AREA(ACRES) =     1.89   SUBAREA RUNOFF(CFS) =     8.69
 TOTAL AREA(ACRES) =      28.45   TOTAL RUNOFF(CFS) =  131.86
 TC(MIN.) =  10.40

********************************************************************************
 FLOW PROCESS FROM NODE    2024.00 TO NODE    1999.00 IS CODE =  52
--------------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     975.00  DOWNSTREAM(FEET) =     950.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   270.00   CHANNEL SLOPE =  0.0926
 CHANNEL FLOW THRU SUBAREA(CFS) =     131.86
 FLOW VELOCITY(FEET/SEC) =  15.70 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =    0.29   Tc(MIN.) =  10.69
 LONGEST FLOWPATH FROM NODE    2022.00 TO NODE    1999.00 =  2365.00 FEET.

********************************************************************************
 FLOW PROCESS FROM NODE    2024.00 TO NODE    1999.00 IS CODE =  81
--------------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.650
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.8057
 SUBAREA AREA(ACRES) =     1.88   SUBAREA RUNOFF(CFS) =     8.50
 TOTAL AREA(ACRES) =      30.33   TOTAL RUNOFF(CFS) =  138.06
 TC(MIN.) =  10.69
================================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =      30.33  TC(MIN.) =      10.69
 PEAK FLOW RATE(CFS)    =     138.06
================================================================================
================================================================================
 END OF RATIONAL METHOD ANALYSIS
```

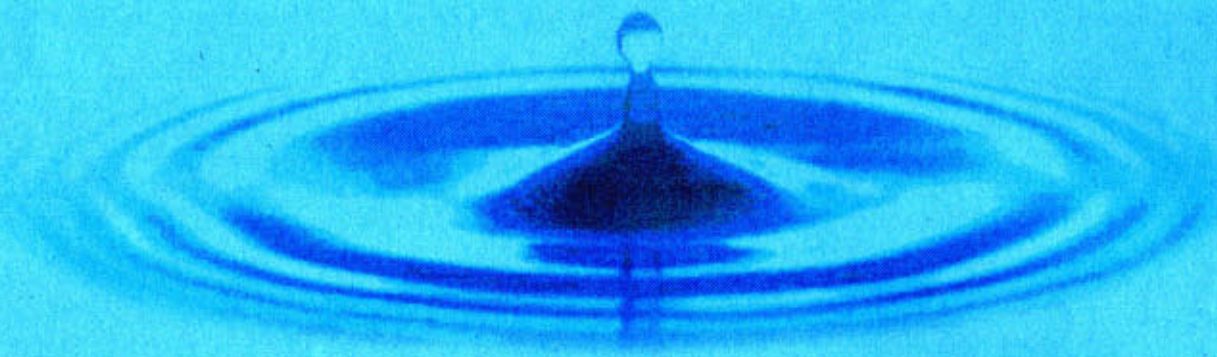
APPENDIX A

AES - 2005

Rational Method Hydrology

Proposed Condition

BASIN B



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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MER21-PD

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2133	2132	2	1,095.0	1,050.0	100.0	0.81	0.36	
2132	2131	5	1,050.0	1,020.0	900.0			
2132	2131	8				0.81	13.01	
2131	2130	5	1,020.0	1,010.0	485.0			
2131	2130	8				0.82	2.27	
2103	2130	8				0.46	6.76	
2130	2101	5	1,010.0	1,000.0	520.0			
2130	2101	8				0.46	3.82	
2101	2101	10						Bank #1
2122	2121	2	1,100.0	1,094.0	100.0	0.81	0.26	
2121	2120	6	1,094.0	1,020.0	880.0	0.81	3.55	
2120	2120	1						1 of 2
2112	2111	2	1,222.0	1,195.0	100.0	0.82	0.24	
2111	2110	5	1,195.0	1,070.0	275.0			
2110	2110	8				0.42	3.86	
2110	2120	3	1,067.0	1,016.0	190.0			
2120	2120	1						2 of 2
2120	2101	3	1,015.9	1,000.0	575.0			
2120	2101	8				0.80	3.67	
2101	2101	11						Add Bank #1
2101	2100	3	1,000.0	980.0	140.0			
2100	21	3	980.0	950.0	620.0			
21	21	7						DET OUT Q = 44.37 CFS
							37.8	Total Area

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

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                       2003,1985,1981 HYDROLOGY MANUAL
        (c) Copyright 1982-2004 Advanced Engineering Software (aes)
            Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                          Analysis prepared by:

                    FUSCOE ENGINEERING - SAN DIEGO, INC.
                      6390 GREENWICH DRIVE, SUITE 170
                        SAN DIEGO, CALIFORNIA 92122
                             (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 21 - WITH DETENTION STORAGE ROUTING                          *
* 2469.01A - OCTOBER 2006                                                 *
 *************************************************************************

  FILE NAME: MER21-PD.DAT
  TIME/DATE OF STUDY: 10:08 10/02/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   2133.00 TO NODE   2132.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8100
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1095.00
  DOWNSTREAM ELEVATION(FEET) =   1050.00
  ELEVATION DIFFERENCE(FEET) =     45.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.423
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) =      2.69
TOTAL AREA(ACRES) =      0.36   TOTAL RUNOFF(CFS) =      2.69

****************************************************************************
FLOW PROCESS FROM NODE   2132.00 TO NODE   2131.00 IS CODE =  52
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1050.00  DOWNSTREAM(FEET) =   1020.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   900.00   CHANNEL SLOPE =  0.0333
CHANNEL FLOW THRU SUBAREA(CFS) =      2.69
FLOW VELOCITY(FEET/SEC) =   3.35 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   4.48   Tc(MIN.) =   6.90
LONGEST FLOWPATH FROM NODE   2133.00 TO NODE   2131.00 =  1000.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   2132.00 TO NODE   2131.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.488
*USER SPECIFIED(SUBAREA):
RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8100
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.8100
SUBAREA AREA(ACRES) =   13.01   SUBAREA RUNOFF(CFS) =   78.91
TOTAL AREA(ACRES) =     13.37   TOTAL RUNOFF(CFS) =   81.10
TC(MIN.) =   6.90

****************************************************************************
FLOW PROCESS FROM NODE   2131.00 TO NODE   2130.00 IS CODE =  52
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1020.00  DOWNSTREAM(FEET) =   1010.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   485.00   CHANNEL SLOPE =  0.0206
CHANNEL FLOW THRU SUBAREA(CFS) =     81.10
FLOW VELOCITY(FEET/SEC) =   6.40 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   1.26   Tc(MIN.) =   8.17
LONGEST FLOWPATH FROM NODE   2133.00 TO NODE   2130.00 =  1485.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   2131.00 TO NODE   2130.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.720
*USER SPECIFIED(SUBAREA):
RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8200
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.8115
SUBAREA AREA(ACRES) =    2.27   SUBAREA RUNOFF(CFS) =   12.51
TOTAL AREA(ACRES) =     15.64   TOTAL RUNOFF(CFS) =   85.28
TC(MIN.) =   8.17

****************************************************************************
FLOW PROCESS FROM NODE   2103.00 TO NODE   2130.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
```

```
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.720
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7054
 SUBAREA AREA(ACRES) =    6.76   SUBAREA RUNOFF(CFS) =   20.90
 TOTAL AREA(ACRES) =     22.40   TOTAL RUNOFF(CFS) =  106.18
 TC(MIN.) =   8.17

****************************************************************************
 FLOW PROCESS FROM NODE   2130.00 TO NODE   2101.00 IS CODE =  52
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1010.00  DOWNSTREAM(FEET) =   1000.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   520.00   CHANNEL SLOPE =  0.0192
 CHANNEL FLOW THRU SUBAREA(CFS) =    106.18
 FLOW VELOCITY(FEET/SEC) =   6.70 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.29   Tc(MIN.) =   9.46
 LONGEST FLOWPATH FROM NODE   2133.00 TO NODE   2101.00 =  2005.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2130.00 TO NODE   2101.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.112
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.6696
 SUBAREA AREA(ACRES) =    3.82   SUBAREA RUNOFF(CFS) =   10.74
 TOTAL AREA(ACRES) =     26.22   TOTAL RUNOFF(CFS) =  107.31
 TC(MIN.) =   9.46

****************************************************************************
 FLOW PROCESS FROM NODE   2101.00 TO NODE   2101.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2122.00 TO NODE   2121.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8100
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1100.00
 DOWNSTREAM ELEVATION(FEET) =   1094.00
 ELEVATION DIFFERENCE(FEET) =      6.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.815
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    96.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      1.94
```

```
 TOTAL AREA(ACRES) =      0.26   TOTAL RUNOFF(CFS) =      1.94

****************************************************************************
 FLOW PROCESS FROM NODE   2121.00 TO NODE   2120.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1094.00  DOWNSTREAM ELEVATION(FEET) = 1020.00
 STREET LENGTH(FEET) =   880.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 16.00

 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(curb-to-curb) =   0.0130
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      15.20
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.32
   HALFSTREET FLOOD WIDTH(FEET) =    9.60
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.31
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.33
 STREET FLOW TRAVEL TIME(MIN.) =   2.01   Tc(MIN.) =   4.82
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8100
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.810
 SUBAREA AREA(ACRES) =     3.55      SUBAREA RUNOFF(CFS) =   26.52
 TOTAL AREA(ACRES) =       3.81        PEAK FLOW RATE(CFS) =      28.46

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.37   HALFSTREET FLOOD WIDTH(FEET) =  12.43
 FLOW VELOCITY(FEET/SEC.) =  8.55   DEPTH*VELOCITY(FT*FT/SEC.) =   3.21
 LONGEST FLOWPATH FROM NODE   2122.00 TO NODE   2120.00 =   980.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2120.00 TO NODE   2120.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   4.82
 RAINFALL INTENSITY(INCH/HR) =   9.22
 TOTAL STREAM AREA(ACRES) =     3.81
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     28.46

****************************************************************************
 FLOW PROCESS FROM NODE   2112.00 TO NODE   2111.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .8200
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
```

```
 UPSTREAM ELEVATION(FEET) =   1222.00
 DOWNSTREAM ELEVATION(FEET) =   1195.00
 ELEVATION DIFFERENCE(FEET) =     27.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.340
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      1.81
 TOTAL AREA(ACRES) =      0.24   TOTAL RUNOFF(CFS) =      1.81

****************************************************************************
 FLOW PROCESS FROM NODE   2111.00 TO NODE   2110.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1195.00  DOWNSTREAM(FEET) =   1070.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   275.00   CHANNEL SLOPE =  0.4545
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2205 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      1.81
 FLOW VELOCITY(FEET/SEC) =   3.21 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.43   Tc(MIN.) =   3.77
 LONGEST FLOWPATH FROM NODE   2112.00 TO NODE   2110.00 =   375.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2110.00 TO NODE   2110.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4200
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4434
 SUBAREA AREA(ACRES) =    3.86   SUBAREA RUNOFF(CFS) =   14.95
 TOTAL AREA(ACRES) =      4.10   TOTAL RUNOFF(CFS) =   16.76
 TC(MIN.) =   3.77

****************************************************************************
 FLOW PROCESS FROM NODE   2110.00 TO NODE   2120.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1067.00  DOWNSTREAM(FEET) =  1016.00
 FLOW LENGTH(FEET) =   190.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  26.10
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     16.76
 PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =   3.89
 LONGEST FLOWPATH FROM NODE   2112.00 TO NODE   2120.00 =   565.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2120.00 TO NODE   2120.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
```

```
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    3.89
 RAINFALL INTENSITY(INCH/HR) =    9.22
 TOTAL STREAM AREA(ACRES) =      4.10
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      16.76

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY       AREA
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)     (ACRE)
     1        28.46      4.82         9.222          3.81
     2        16.76      3.89         9.222          4.10

 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        39.73      3.89         9.222
     2        45.22      4.82         9.222

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      45.22   Tc(MIN.) =     4.82
 TOTAL AREA(ACRES) =       7.91
 LONGEST FLOWPATH FROM NODE   2122.00 TO NODE   2120.00 =   980.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2120.00 TO NODE   2101.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1015.90  DOWNSTREAM(FEET) =  1000.00
 FLOW LENGTH(FEET) =   575.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  13.95
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      45.22
 PIPE TRAVEL TIME(MIN.) =   0.69    Tc(MIN.) =   5.51
 LONGEST FLOWPATH FROM NODE   2122.00 TO NODE   2101.00 =  1555.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2120.00 TO NODE   2101.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.664
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.6770
 SUBAREA AREA(ACRES) =     3.67   SUBAREA RUNOFF(CFS) =   25.44
 TOTAL AREA(ACRES) =      11.58   TOTAL RUNOFF(CFS) =   67.93
 TC(MIN.) =   5.51

****************************************************************************
 FLOW PROCESS FROM NODE   2101.00 TO NODE   2101.00 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        67.93      5.51       8.664       11.58
  LONGEST FLOWPATH FROM NODE   2122.00 TO NODE   2101.00 =  1555.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc       INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1       107.31      9.46       6.112       26.22
  LONGEST FLOWPATH FROM NODE   2133.00 TO NODE   2101.00 =  2005.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc       INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      130.40       5.51        8.664
     2      155.23       9.46        6.112

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    155.23   Tc(MIN.) =    9.46
  TOTAL AREA(ACRES) =     37.80

****************************************************************************
  FLOW PROCESS FROM NODE   2101.00 TO NODE   2101.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =   9.46   RAIN INTENSITY(INCH/HOUR) =  6.11
  TOTAL AREA(ACRES) =    37.80   TOTAL RUNOFF(CFS) =     44.37

****************************************************************************
  FLOW PROCESS FROM NODE   2101.00 TO NODE   2100.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1000.00  DOWNSTREAM(FEET) =   980.00
  FLOW LENGTH(FEET) =   140.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  26.12
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     44.37
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =   9.55
  LONGEST FLOWPATH FROM NODE   2133.00 TO NODE   2100.00 =  2145.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2100.00 TO NODE     21.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   980.00  DOWNSTREAM(FEET) =   950.00
  FLOW LENGTH(FEET) =   620.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  18.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.08
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     44.37
  PIPE TRAVEL TIME(MIN.) =   0.60    Tc(MIN.) =  10.15
  LONGEST FLOWPATH FROM NODE   2133.00 TO NODE     21.00 =  2765.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     37.80  TC(MIN.) =     10.15
  PEAK FLOW RATE(CFS)   =     44.37
============================================================================
```

END OF RATIONAL METHOD ANALYSIS

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR22-P

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2207	2206	2	1,387.5	1,330.0	100.0	0.35	0.29	
2206	2204	5	1,330.0	892.0	1,125.0			
2206	2204	8				0.45	6.75	
2205	2204	8				0.456	7.95	
2204	2200	5	892.0	828.0	440.0			
2204	2200	8				0.428	2.31	
2200	2200	1						1 of 2
2203	2202	2	1,190.0	1,160.0	100.0	0.35	0.21	
2202	2201	5	1,160.0	884.5	813.0			
2202	2201	8				0.46	8.77	
2201	2200	5	884.5	828.0	446.0			
2201	2200	8				0.434	4.51	
2200	2200	1						2 of 2
2200	22	4	817.0	815.0	46.0			EX. 24" CMP
								Storm Drain
							30.79	Total Area

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

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                        2003,1985,1981 HYDROLOGY MANUAL
       (c) Copyright 1982-2004 Advanced Engineering Software (aes)
           Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                          Analysis prepared by:

                    FUSCOE ENGINEERING - SAN DIEGO, INC
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                        SAN DIEGO, CALIFORNIA 92122
                              (858) 554-1500

 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                 *
* SUBBASIN # 22                                                          *
* 2469.01A - OCTOBER 2006                                                *
 ************************************************************************

  FILE NAME: MERR22-P.DAT
  TIME/DATE OF STUDY: 15:05 09/28/2006
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   2207.00 TO NODE   2206.00 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) =   1387.50
  DOWNSTREAM ELEVATION(FEET) =   1330.00
  ELEVATION DIFFERENCE(FEET) =     57.50
  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) =  7.972
 SUBAREA RUNOFF(CFS) =      0.81
 TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      0.81

****************************************************************************
 FLOW PROCESS FROM NODE   2206.00 TO NODE   2204.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1330.00  DOWNSTREAM(FEET) =    892.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1125.00   CHANNEL SLOPE =  0.3893
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2121 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.81
 FLOW VELOCITY(FEET/SEC) =   2.58 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   7.27   Tc(MIN.) =  13.54
 LONGEST FLOWPATH FROM NODE   2207.00 TO NODE   2204.00 =  1225.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2206.00 TO NODE   2204.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.851
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4459
 SUBAREA AREA(ACRES) =     6.75   SUBAREA RUNOFF(CFS) =   14.73
 TOTAL AREA(ACRES) =      7.04   TOTAL RUNOFF(CFS) =   15.23
 TC(MIN.) =  13.54

****************************************************************************
 FLOW PROCESS FROM NODE   2205.00 TO NODE   2204.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.851
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4560
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4512
 SUBAREA AREA(ACRES) =     7.95   SUBAREA RUNOFF(CFS) =   17.59
 TOTAL AREA(ACRES) =     14.99   TOTAL RUNOFF(CFS) =   32.81
 TC(MIN.) =  13.54

****************************************************************************
 FLOW PROCESS FROM NODE   2204.00 TO NODE   2200.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    892.00  DOWNSTREAM(FEET) =    828.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   445.00   CHANNEL SLOPE =  0.1438
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1309 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     32.81
 FLOW VELOCITY(FEET/SEC) =   6.48 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.14   Tc(MIN.) =  14.68
 LONGEST FLOWPATH FROM NODE   2207.00 TO NODE   2200.00 =  1670.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2204.00 TO NODE   2200.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.603
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4280
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4481
  SUBAREA AREA(ACRES) =    2.31   SUBAREA RUNOFF(CFS) =    4.55
  TOTAL AREA(ACRES) =     17.30   TOTAL RUNOFF(CFS) =   35.69
  TC(MIN.) =  14.68

****************************************************************************
  FLOW PROCESS FROM NODE   2200.00 TO NODE   2200.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  14.68
  RAINFALL INTENSITY(INCH/HR) =   4.60
  TOTAL STREAM AREA(ACRES) =    17.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     35.69

****************************************************************************
  FLOW PROCESS FROM NODE   2203.00 TO NODE   2202.00 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) =   1190.00
  DOWNSTREAM ELEVATION(FEET) =   1160.00
  ELEVATION DIFFERENCE(FEET) =     30.00
  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) =  7.972
  SUBAREA RUNOFF(CFS) =      0.59
  TOTAL AREA(ACRES) =      0.21   TOTAL RUNOFF(CFS) =      0.59

****************************************************************************
  FLOW PROCESS FROM NODE   2202.00 TO NODE   2201.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1160.00  DOWNSTREAM(FEET) =    884.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =   813.00   CHANNEL SLOPE =  0.3389
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2033 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.59
  FLOW VELOCITY(FEET/SEC) =   2.52 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   5.37   Tc(MIN.) =  11.63
  LONGEST FLOWPATH FROM NODE   2203.00 TO NODE   2201.00 =   913.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2202.00 TO NODE   2201.00 IS CODE =  81
----------------------------------------------------------------------------
```

```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.349
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4574
  SUBAREA AREA(ACRES) =     8.77   SUBAREA RUNOFF(CFS) =   21.58
  TOTAL AREA(ACRES) =       8.98   TOTAL RUNOFF(CFS) =   21.97
  TC(MIN.) =  11.63

****************************************************************************
  FLOW PROCESS FROM NODE   2201.00 TO NODE   2200.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    884.50  DOWNSTREAM(FEET) =    828.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   446.00   CHANNEL SLOPE =  0.1267
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1195 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     21.97
  FLOW VELOCITY(FEET/SEC) =   5.42 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.37   Tc(MIN.) =  13.01
  LONGEST FLOWPATH FROM NODE   2203.00 TO NODE   2200.00 =  1359.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2201.00 TO NODE   2200.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.978
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4340
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4496
  SUBAREA AREA(ACRES) =     4.51   SUBAREA RUNOFF(CFS) =    9.74
  TOTAL AREA(ACRES) =      13.49   TOTAL RUNOFF(CFS) =   30.19
  TC(MIN.) =  13.01

****************************************************************************
  FLOW PROCESS FROM NODE   2200.00 TO NODE   2200.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  13.01
  RAINFALL INTENSITY(INCH/HR) =   4.98
  TOTAL STREAM AREA(ACRES) =    13.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     30.19

  ** CONFLUENCE DATA **
  STREAM      RUNOFF       Tc       INTENSITY       AREA
  NUMBER       (CFS)     (MIN.)    (INCH/HOUR)     (ACRE)
      1        35.69     14.68         4.603          17.30
      2        30.19     13.01         4.978          13.49

  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       61.81    13.01       4.978
      2       63.61    14.68       4.603

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     63.61   Tc(MIN.) =   14.68
  TOTAL AREA(ACRES) =     30.79
  LONGEST FLOWPATH FROM NODE   2207.00 TO NODE   2200.00 =  1670.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2200.00 TO NODE     22.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   817.00  DOWNSTREAM(FEET) =   815.00
  FLOW LENGTH(FEET) =    46.00   MANNING'S N =  0.024
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.51
  (PIPE FLOW VELOCITY CORRESPONDING TO NORMAL-DEPTH FLOW
   AT DEPTH = 0.94 * DIAMETER)
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     63.61
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =  14.77
  LONGEST FLOWPATH FROM NODE   2207.00 TO NODE     22.00 =  1716.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     30.79  TC(MIN.) =     14.77
  PEAK FLOW RATE(CFS)   =     63.61
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MER221-P

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2213	2212	2	1,185.0	1,163.0	100.0	0.35	0.2	
2212	2211	5	1,163.0	1,095.0	305.0			
2212	2211	8				0.46	1.57	
2211	2210	5	1,095.0	850.0	865.0			
2211	2210	8				0.44	8.57	
2210	22.1	4	831.0	827.0	50.0			EX. 24" CMP
								Storm Drain
							10.34	Total Area

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

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                        2003,1985,1981 HYDROLOGY MANUAL
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           Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                          Analysis prepared by:

                     FUSCOE ENGINEERING - SAN DIEGO, INC
                       6390 GREENWICH DRIVE, SUITE 170
                         SAN DIEGO, CALIFORNIA 92122
                              (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 221                                                          *
* 2469.01A - OCTOBER 2006                                                 *
 *************************************************************************

  FILE NAME: MER221-P.DAT
  TIME/DATE OF STUDY: 15:07 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   2213.00 TO NODE   2212.00 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) =   1185.00
  DOWNSTREAM ELEVATION(FEET) =   1163.00
  ELEVATION DIFFERENCE(FEET) =     22.00
  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) =  7.972
 SUBAREA RUNOFF(CFS) =      0.56
 TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      0.56

****************************************************************************
 FLOW PROCESS FROM NODE   2212.00 TO NODE   2211.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1163.00  DOWNSTREAM(FEET) =   1095.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   305.00   CHANNEL SLOPE =  0.2230
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1710 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.56
 FLOW VELOCITY(FEET/SEC) =   2.32 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.20   Tc(MIN.) =   8.46
 LONGEST FLOWPATH FROM NODE   2213.00 TO NODE   2211.00 =   405.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2212.00 TO NODE   2211.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.568
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4476
 SUBAREA AREA(ACRES) =     1.57   SUBAREA RUNOFF(CFS) =     4.74
 TOTAL AREA(ACRES) =      1.77   TOTAL RUNOFF(CFS) =    5.20
 TC(MIN.) =   8.46

****************************************************************************
 FLOW PROCESS FROM NODE   2211.00 TO NODE   2210.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1095.00  DOWNSTREAM(FEET) =    850.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   865.00   CHANNEL SLOPE =  0.2832
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1908 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      5.20
 FLOW VELOCITY(FEET/SEC) =   4.24 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.40   Tc(MIN.) =  11.86
 LONGEST FLOWPATH FROM NODE   2213.00 TO NODE   2210.00 =  1270.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2211.00 TO NODE   2210.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.281
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4400
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4413
 SUBAREA AREA(ACRES) =     8.57   SUBAREA RUNOFF(CFS) =    19.91
 TOTAL AREA(ACRES) =     10.34   TOTAL RUNOFF(CFS) =   24.10
 TC(MIN.) =  11.86
```

```
**************************************************************************
 FLOW PROCESS FROM NODE   2210.00 TO NODE     22.10 IS CODE =  41
--------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   831.00  DOWNSTREAM(FEET) =   827.00
 FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.024
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  11.43
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     24.10
 PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =  11.94
 LONGEST FLOWPATH FROM NODE   2213.00 TO NODE     22.10 =  1320.00 FEET.
==========================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =     10.34  TC(MIN.) =     11.94
 PEAK FLOW RATE(CFS)    =     24.10
==========================================================================
==========================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MER222-P

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2223	2222	2	1,185.0	1,140.0	100.0	0.35	0.26	
2222	2221	5	1,140.0	1,066.5	465.0			
2222	2221	8				0.46	4.64	
2221	2220	5	1,066.5	885.0	430.0			
2221	2220	8				0.445	5.09	
2220	22.2	4	885.0	845.0	235.0			EX. 24" CMP
								Storm Drain
							9.99	Total Area

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

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                          Analysis prepared by:

                     FUSCOE ENGINEERING - SAN DIEGO, INC
                       6390 GREENWICH DRIVE, SUITE 170
                         SAN DIEGO, CALIFORNIA 92122
                              (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 222                                                          *
* 2469.01A - OCTOBER 2006                                                 *
 *************************************************************************

  FILE NAME: MER222-P.DAT
  TIME/DATE OF STUDY: 15:08 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  5.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   2223.00 TO NODE   2222.00 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) =   1185.00
  DOWNSTREAM ELEVATION(FEET) =   1140.00
  ELEVATION DIFFERENCE(FEET) =     45.00
  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) =  7.972
SUBAREA RUNOFF(CFS) =      0.73
TOTAL AREA(ACRES) =      0.26   TOTAL RUNOFF(CFS) =      0.73

****************************************************************************
 FLOW PROCESS FROM NODE   2222.00 TO NODE   2221.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1140.00  DOWNSTREAM(FEET) =   1066.50
 CHANNEL LENGTH THRU SUBAREA(FEET) =   465.00   CHANNEL SLOPE =  0.1581
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1390 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.73
 FLOW VELOCITY(FEET/SEC) =   2.09 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.71   Tc(MIN.) =   9.98
 LONGEST FLOWPATH FROM NODE   2223.00 TO NODE   2221.00 =   565.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2222.00 TO NODE   2221.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.905
*USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4542
 SUBAREA AREA(ACRES) =     4.64   SUBAREA RUNOFF(CFS) =   12.60
 TOTAL AREA(ACRES) =      4.90   TOTAL RUNOFF(CFS) =   13.14
 TC(MIN.) =   9.98

****************************************************************************
 FLOW PROCESS FROM NODE   2221.00 TO NODE   2220.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1066.50  DOWNSTREAM(FEET) =    885.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   430.00   CHANNEL SLOPE =  0.4221
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2167 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     13.14
 FLOW VELOCITY(FEET/SEC) =   6.15 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.17   Tc(MIN.) =  11.14
 LONGEST FLOWPATH FROM NODE   2223.00 TO NODE   2220.00 =   995.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2221.00 TO NODE   2220.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.499
*USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4450
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4495
 SUBAREA AREA(ACRES) =     5.09   SUBAREA RUNOFF(CFS) =   12.46
 TOTAL AREA(ACRES) =      9.99   TOTAL RUNOFF(CFS) =   24.69
 TC(MIN.) =  11.14
```

```
**********************************************************************************
  FLOW PROCESS FROM NODE    2220.00 TO NODE      22.20 IS CODE =  41
----------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    885.00  DOWNSTREAM(FEET) =    845.00
  FLOW LENGTH(FEET) =    235.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  12.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.38
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =    1
  PIPE-FLOW(CFS) =     24.69
  PIPE TRAVEL TIME(MIN.) =    0.25    Tc(MIN.) =  11.40
  LONGEST FLOWPATH FROM NODE    2223.00 TO NODE      22.20 =  1230.00 FEET.
==================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =       9.99  TC(MIN.) =     11.40
  PEAK FLOW RATE(CFS)    =      24.69
==================================================================================
==================================================================================
  END OF RATIONAL METHOD ANALYSIS

```

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MER223-P

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2232	2231	2	1,240.0	1,195.0	100.0	0.35	0.26	
2231	2230	5	1,195.0	895.0	628.0			
2231	2230	8				0.449	4.67	
2230	22.3	4	895.0	888.9	40.0			EX. 24" Caltrans
								Storm Drain
							4.93	Total Area

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

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                          Analysis prepared by:

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                         SAN DIEGO, CALIFORNIA 92122
                              (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 223                                                          *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MER223-P.DAT
  TIME/DATE OF STUDY: 15:09 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   2232.00 TO NODE   2231.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. 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) =   1240.00
  DOWNSTREAM ELEVATION(FEET) =   1195.00
  ELEVATION DIFFERENCE(FEET) =     45.00
  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) =  7.972
 SUBAREA RUNOFF(CFS) =      0.73
 TOTAL AREA(ACRES) =      0.26   TOTAL RUNOFF(CFS) =      0.73

****************************************************************************
 FLOW PROCESS FROM NODE   2231.00 TO NODE   2230.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1195.00  DOWNSTREAM(FEET) =    895.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   628.00   CHANNEL SLOPE =  0.4777
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2228 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.73
 FLOW VELOCITY(FEET/SEC) =   2.64 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.96   Tc(MIN.) =  10.23
 LONGEST FLOWPATH FROM NODE   2232.00 TO NODE   2230.00 =   728.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2231.00 TO NODE   2230.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.813
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4490
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4438
 SUBAREA AREA(ACRES) =     4.67   SUBAREA RUNOFF(CFS) =   12.19
 TOTAL AREA(ACRES) =      4.93   TOTAL RUNOFF(CFS) =   12.72
 TC(MIN.) =  10.23

****************************************************************************
 FLOW PROCESS FROM NODE   2230.00 TO NODE     22.30 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   895.00  DOWNSTREAM(FEET) =   888.90
 FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.024
 DEPTH OF FLOW IN  24.0 INCH PIPE IS   8.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  12.40
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     12.72
 PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =  10.28
 LONGEST FLOWPATH FROM NODE   2232.00 TO NODE     22.30 =   768.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =      4.93  TC(MIN.) =     10.28
 PEAK FLOW RATE(CFS)    =     12.72
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MER224-P

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2242	2241	2	1,205.0	1,135.0	100.0	0.35	0.15	
2241	2240	5	1,135.0	920.0	874.5			
2241	2240	8				0.314	4.8	
2240	22.4	4	920.0	915.0	57.5			EX. 18" CMP
							4.95	Total Area

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

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                              Analysis prepared by:

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                            SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 224                                                          *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MER224-P.DAT
  TIME/DATE OF STUDY: 15:11 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   2242.00 TO NODE   2241.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. 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) =   1205.00
  DOWNSTREAM ELEVATION(FEET) =   1135.00
  ELEVATION DIFFERENCE(FEET) =     70.00
  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) =  7.972
SUBAREA RUNOFF(CFS) =      0.42
TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.42

****************************************************************************
FLOW PROCESS FROM NODE   2241.00 TO NODE   2240.00 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1135.00  DOWNSTREAM(FEET) =    920.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   874.50   CHANNEL SLOPE =  0.2459
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .1786 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) =      0.42
FLOW VELOCITY(FEET/SEC) =   2.37 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   6.16   Tc(MIN.) =  12.42
LONGEST FLOWPATH FROM NODE   2242.00 TO NODE   2240.00 =   974.50 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   2241.00 TO NODE   2240.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.127
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .3140
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3151
SUBAREA AREA(ACRES) =     4.80   SUBAREA RUNOFF(CFS) =     7.73
TOTAL AREA(ACRES) =      4.95   TOTAL RUNOFF(CFS) =     8.00
TC(MIN.) =  12.42

****************************************************************************
FLOW PROCESS FROM NODE   2240.00 TO NODE     22.40 IS CODE =  41
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   920.00  DOWNSTREAM(FEET) =   915.00
FLOW LENGTH(FEET) =    57.50   MANNING'S N =  0.024
DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =   9.02
GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =      8.00
PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =  12.53
LONGEST FLOWPATH FROM NODE   2242.00 TO NODE     22.40 =  1032.00 FEET.
============================================================================
END OF STUDY SUMMARY:
TOTAL AREA(ACRES)     =      4.95  TC(MIN.) =     12.53
PEAK FLOW RATE(CFS)   =      8.00
============================================================================
============================================================================
END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR23-p

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2304	2303	2	1,325.0	1,268.0	100.0	0.35	1.04	
2303	2301	5	1,268.0	863.0	1,070.0			
2303	2301	8				0.456	7.47	
2301	2300	5	863.0	808.0	510.0			
2301	2300	8				0.42	14.08	
2300	23	4	808.0	801.0	100.0			Existing 36"CMP Culvert
								Storm Drain
							22.59	Total Area

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

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                          Analysis prepared by:

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 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 23                                                           *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MERR23-P.DAT
  TIME/DATE OF STUDY: 15:13 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   2304.00 TO NODE   2303.00 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) =   1325.00
  DOWNSTREAM ELEVATION(FEET) =   1268.00
  ELEVATION DIFFERENCE(FEET) =     57.00
  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) =  7.972
 SUBAREA RUNOFF(CFS) =      2.90
 TOTAL AREA(ACRES) =      1.04   TOTAL RUNOFF(CFS) =      2.90

****************************************************************************
 FLOW PROCESS FROM NODE   2303.00 TO NODE   2301.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1268.00  DOWNSTREAM(FEET) =    863.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1070.00   CHANNEL SLOPE =  0.3785
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2102 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      2.90
 FLOW VELOCITY(FEET/SEC) =   3.66 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   4.87   Tc(MIN.) =  11.14
 LONGEST FLOWPATH FROM NODE   2304.00 TO NODE   2301.00 =  1170.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2303.00 TO NODE   2301.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.501
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4560
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4430
 SUBAREA AREA(ACRES) =     7.47   SUBAREA RUNOFF(CFS) =   18.74
 TOTAL AREA(ACRES) =       8.51   TOTAL RUNOFF(CFS) =   20.74
 TC(MIN.) =  11.14

****************************************************************************
 FLOW PROCESS FROM NODE   2301.00 TO NODE   2300.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    863.00  DOWNSTREAM(FEET) =    808.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   510.00   CHANNEL SLOPE =  0.1078
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1059 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     20.74
 FLOW VELOCITY(FEET/SEC) =   5.00 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.70   Tc(MIN.) =  12.84
 LONGEST FLOWPATH FROM NODE   2304.00 TO NODE   2300.00 =  1680.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2301.00 TO NODE   2300.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.020
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4287
 SUBAREA AREA(ACRES) =    14.08   SUBAREA RUNOFF(CFS) =   29.68
 TOTAL AREA(ACRES) =      22.59   TOTAL RUNOFF(CFS) =   48.61
 TC(MIN.) =  12.84

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

```
  FLOW PROCESS FROM NODE   2300.00 TO NODE     23.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   808.00  DOWNSTREAM(FEET) =   801.00
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  18.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.05
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     48.61
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =  12.96
  LONGEST FLOWPATH FROM NODE   2304.00 TO NODE     23.00 =  1780.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     22.59  TC(MIN.) =     12.96
  PEAK FLOW RATE(CFS)   =     48.61
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MER231-P

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2312	2311	2	1,150.0	1,080.0	100.0	0.46	0.13	
2311	2310	5	1,080.0	815.0	930.0			
2311	2310	8				0.428	4.32	
2310	23.1	4	815.0	813.0	46.0			EX. 24" CMP Culvert
							4.45	Total Area

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

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
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                            Analysis prepared by:

                     FUSCOE ENGINEERING - SAN DIEGO, INC
                       6390 GREENWICH DRIVE, SUITE 170
                         SAN DIEGO, CALIFORNIA 92122
                              (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 231                                                          *
* 2469.01A - OCTOBER 2006                                                 *
 ***************************************************************************

  FILE NAME: MER231-P.DAT
  TIME/DATE OF STUDY: 15:15 09/28/2006
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   2312.00 TO NODE   2311.00 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) =   1150.00
  DOWNSTREAM ELEVATION(FEET) =   1080.00
  ELEVATION DIFFERENCE(FEET) =     70.00
  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) =  8.830
 SUBAREA RUNOFF(CFS) =      0.53
 TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.53

****************************************************************************
 FLOW PROCESS FROM NODE   2311.00 TO NODE   2310.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1080.00  DOWNSTREAM(FEET) =    815.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   930.00   CHANNEL SLOPE =  0.2849
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1912 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.53
 FLOW VELOCITY(FEET/SEC) =   2.45 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   6.33   Tc(MIN.) =  11.68
 LONGEST FLOWPATH FROM NODE   2312.00 TO NODE   2310.00 =  1030.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2311.00 TO NODE   2310.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.336
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4280
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4289
 SUBAREA AREA(ACRES) =     4.32   SUBAREA RUNOFF(CFS) =     9.87
 TOTAL AREA(ACRES) =      4.45   TOTAL RUNOFF(CFS) =   10.19
 TC(MIN.) =  11.68

****************************************************************************
 FLOW PROCESS FROM NODE   2310.00 TO NODE     23.10 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   815.00  DOWNSTREAM(FEET) =   813.00
 FLOW LENGTH(FEET) =    46.00   MANNING'S N =  0.024
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  10.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.38
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     10.19
 PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =  11.78
 LONGEST FLOWPATH FROM NODE   2312.00 TO NODE     23.10 =  1076.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =      4.45  TC(MIN.) =     11.78
 PEAK FLOW RATE(CFS)   =     10.19
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MER232-P

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2323	2322	2	1,350.0	1,300.0	100.0	0.46	0.29	
2322	2321	5	1,300.0	950.0	715.0			
2322	2321	8				0.46	2.78	
2321	2320	5	950.0	810.0	715.0			
2321	2320	8				0.421	4.83	
2320	23.2	4	810.0	808.0	50.0			Existing 24"CMP culvert
							7.9	Total Area

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

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                              Analysis prepared by:

                        FUSCOE ENGINEERING - SAN DIEGO, INC
                          6390 GREENWICH DRIVE, SUITE 170
                            SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 232                                                          *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MER232-P.DAT
  TIME/DATE OF STUDY: 15:18 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   2323.00 TO NODE   2322.00 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) =   1350.00
  DOWNSTREAM ELEVATION(FEET) =   1300.00
  ELEVATION DIFFERENCE(FEET) =     50.00
  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) =  8.830
SUBAREA RUNOFF(CFS) =      1.18
TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      1.18

****************************************************************************
 FLOW PROCESS FROM NODE   2322.00 TO NODE   2321.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1300.00  DOWNSTREAM(FEET) =    950.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   715.00   CHANNEL SLOPE =  0.4895
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2240 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      1.18
 FLOW VELOCITY(FEET/SEC) =   2.80 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   4.26   Tc(MIN.) =   9.61
 LONGEST FLOWPATH FROM NODE   2323.00 TO NODE   2321.00 =   815.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2322.00 TO NODE   2321.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.052
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4600
 SUBAREA AREA(ACRES) =     2.78   SUBAREA RUNOFF(CFS) =     7.74
 TOTAL AREA(ACRES) =      3.07   TOTAL RUNOFF(CFS) =    8.55
 TC(MIN.) =   9.61

****************************************************************************
 FLOW PROCESS FROM NODE   2321.00 TO NODE   2320.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    950.00  DOWNSTREAM(FEET) =    810.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   715.00   CHANNEL SLOPE =  0.1958
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1579 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      8.55
 FLOW VELOCITY(FEET/SEC) =   4.55 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.62   Tc(MIN.) =  12.23
 LONGEST FLOWPATH FROM NODE   2323.00 TO NODE   2320.00 =  1530.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2321.00 TO NODE   2320.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.180
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4210
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4362
 SUBAREA AREA(ACRES) =     4.83   SUBAREA RUNOFF(CFS) =    10.53
 TOTAL AREA(ACRES) =      7.90   TOTAL RUNOFF(CFS) =   17.85
 TC(MIN.) =  12.23

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

```
 FLOW PROCESS FROM NODE   2320.00 TO NODE     23.20 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   810.00  DOWNSTREAM(FEET) =   808.00
 FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.024
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.16
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     17.85
 PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =  12.33
 LONGEST FLOWPATH FROM NODE   2323.00 TO NODE     23.20 =  1580.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =      7.90  TC(MIN.) =     12.33
 PEAK FLOW RATE(CFS)    =     17.85
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MER233-P

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2333	2332	2	1,270.0	1,195.0	100.0	0.46	0.32	
2332	2331	5	1,195.0	925.0	515.0			
2332	2331	8				0.46	2.23	
2331	2330	5	925.0	810.0	700.0			
2331	2330	8				0.432	4.94	
2330	23.3	4	810.0	808.0	54.0			Existing 18"CMP Culvert
							7.49	Total Area

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

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                          Analysis prepared by:

                     FUSCOE ENGINEERING - SAN DIEGO, INC
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                         SAN DIEGO, CALIFORNIA 92122
                              (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 233                                                          *
* 2469.01A - OCTOBER 2006                                                 *
 *************************************************************************

  FILE NAME: MER233-P.DAT
  TIME/DATE OF STUDY: 15:19 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   2333.00 TO NODE   2332.00 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) =   1270.00
  DOWNSTREAM ELEVATION(FEET) =   1195.00
  ELEVATION DIFFERENCE(FEET) =     75.00
  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) =  8.830
SUBAREA RUNOFF(CFS) =      1.30
TOTAL AREA(ACRES) =      0.32   TOTAL RUNOFF(CFS) =      1.30

****************************************************************************
 FLOW PROCESS FROM NODE   2332.00 TO NODE   2331.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1195.00  DOWNSTREAM(FEET) =    925.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   515.00   CHANNEL SLOPE =  0.5243
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2262 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      1.30
 FLOW VELOCITY(FEET/SEC) =   2.91 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.95   Tc(MIN.) =   8.30
 LONGEST FLOWPATH FROM NODE   2333.00 TO NODE   2331.00 =   615.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2332.00 TO NODE   2331.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.650
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4600
 SUBAREA AREA(ACRES) =     2.23   SUBAREA RUNOFF(CFS) =    6.82
 TOTAL AREA(ACRES) =      2.55   TOTAL RUNOFF(CFS) =    7.80
 TC(MIN.) =   8.30

****************************************************************************
 FLOW PROCESS FROM NODE   2331.00 TO NODE   2330.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    925.00  DOWNSTREAM(FEET) =    810.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   700.00   CHANNEL SLOPE =  0.1643
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1421 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      7.80
 FLOW VELOCITY(FEET/SEC) =   4.18 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.79   Tc(MIN.) =  11.09
 LONGEST FLOWPATH FROM NODE   2333.00 TO NODE   2330.00 =  1315.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2331.00 TO NODE   2330.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.517
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4320
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4415
 SUBAREA AREA(ACRES) =     4.94   SUBAREA RUNOFF(CFS) =   11.77
 TOTAL AREA(ACRES) =      7.49   TOTAL RUNOFF(CFS) =   18.24
 TC(MIN.) =  11.09

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

```
 FLOW PROCESS FROM NODE    2330.00 TO NODE      23.30 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   810.00  DOWNSTREAM(FEET) =   808.00
 FLOW LENGTH(FEET) =    54.00   MANNING'S N =  0.024
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.48
 (PIPE FLOW VELOCITY CORRESPONDING TO NORMAL-DEPTH FLOW
  AT DEPTH = 0.94 * DIAMETER)
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     18.24
 PIPE TRAVEL TIME(MIN.) =   0.14    Tc(MIN.) =  11.23
 LONGEST FLOWPATH FROM NODE    2333.00 TO NODE     23.30 =  1369.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =      7.49  TC(MIN.) =     11.23
 PEAK FLOW RATE(CFS)    =     18.24
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MER234-P

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2343	2342	2	1,360.0	1,305.0	100.0	0.35	0.12	
2342	2341	5	1,305.0	890.0	1,720.0			
2342	2341	8				0.451	3.46	
2341	2340	5	890.0	810.0	631.0			
2341	2340	8				0.421	6.83	
2340	23.4	4	810.0	808.0	64.0			Existing 24"CMP Culvert
							10.41	Total Area

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

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                        2003,1985,1981 HYDROLOGY MANUAL
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                          Analysis prepared by:

                      FUSCOE ENGINEERING - SAN DIEGO, INC
                        6390 GREENWICH DRIVE, SUITE 170
                          SAN DIEGO, CALIFORNIA 92122
                               (858) 554-1500

 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                 *
* SUBBASIN # 234                                                         *
* 2469.01A - OCTOBER 2006                                                *
 **************************************************************************

  FILE NAME: MER234-P.DAT
  TIME/DATE OF STUDY: 15:21 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   2343.00 TO NODE   2342.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. 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) =   1360.00
  DOWNSTREAM ELEVATION(FEET) =   1305.00
  ELEVATION DIFFERENCE(FEET) =     55.00
  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) =  7.972
SUBAREA RUNOFF(CFS) =      0.33
TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.33

****************************************************************************
 FLOW PROCESS FROM NODE   2342.00 TO NODE   2341.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1305.00  DOWNSTREAM(FEET) =    890.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1720.00   CHANNEL SLOPE =  0.2413
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1771 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.33
 FLOW VELOCITY(FEET/SEC) =   2.36 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =  12.16   Tc(MIN.) =  18.43
 LONGEST FLOWPATH FROM NODE   2343.00 TO NODE   2341.00 =  1820.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2342.00 TO NODE   2341.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.975
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4510
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4476
 SUBAREA AREA(ACRES) =     3.46   SUBAREA RUNOFF(CFS) =     6.20
 TOTAL AREA(ACRES) =       3.58   TOTAL RUNOFF(CFS) =    6.37
 TC(MIN.) =  18.43

****************************************************************************
 FLOW PROCESS FROM NODE   2341.00 TO NODE   2340.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    890.00  DOWNSTREAM(FEET) =    810.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   631.00   CHANNEL SLOPE =  0.1268
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1195 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      6.37
 FLOW VELOCITY(FEET/SEC) =   3.59 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.93   Tc(MIN.) =  21.36
 LONGEST FLOWPATH FROM NODE   2343.00 TO NODE   2340.00 =  2451.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2341.00 TO NODE   2340.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.614
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4210
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4302
 SUBAREA AREA(ACRES) =     6.83   SUBAREA RUNOFF(CFS) =    10.39
 TOTAL AREA(ACRES) =      10.41   TOTAL RUNOFF(CFS) =    16.18
 TC(MIN.) =  21.36
```

```
**************************************************************************
 FLOW PROCESS FROM NODE   2340.00 TO NODE     23.40 IS CODE =  41
--------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   810.00  DOWNSTREAM(FEET) =   808.00
 FLOW LENGTH(FEET) =    64.00   MANNING'S N =  0.024
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.25
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     16.18
 PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =  21.51
 LONGEST FLOWPATH FROM NODE   2343.00 TO NODE     23.40 =  2515.00 FEET.
==========================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     10.41  TC(MIN.) =     21.51
 PEAK FLOW RATE(CFS)   =     16.18
==========================================================================
==========================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR24-P

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2403	2402	2	1,360.0	1,310.0	95.0	0.46	0.33	
2402	2401	5	1,310.0	1,130.0	305.0			
2402	2401	8				0.46	1.82	
2401	2400	5	1,130.0	805.0	1,330.0			
2401	2400	8				0.443	31.33	
2400	24	4	805.0	803.0	50.0			Existing 36" CMP culvert
							33.48	Total Area

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

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              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

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                            SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 24                                                           *
* 2469.01A - OCTOBER 2006                                                 *
 *************************************************************************

  FILE NAME: MERR24-P.DAT
  TIME/DATE OF STUDY: 15:24 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   2403.00 TO NODE   2402.00 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) =    95.00
  UPSTREAM ELEVATION(FEET) =   1360.00
  DOWNSTREAM ELEVATION(FEET) =   1310.00
  ELEVATION DIFFERENCE(FEET) =     50.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.212
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.978
SUBAREA RUNOFF(CFS) =      1.36
TOTAL AREA(ACRES) =      0.33   TOTAL RUNOFF(CFS) =      1.36

****************************************************************************
 FLOW PROCESS FROM NODE   2402.00 TO NODE   2401.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1310.00  DOWNSTREAM(FEET) =   1130.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   305.00   CHANNEL SLOPE =  0.5902
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2295 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      1.36
 FLOW VELOCITY(FEET/SEC) =   2.97 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.71   Tc(MIN.) =   6.92
 LONGEST FLOWPATH FROM NODE   2403.00 TO NODE   2401.00 =   400.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2402.00 TO NODE   2401.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.477
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4600
 SUBAREA AREA(ACRES) =     1.82   SUBAREA RUNOFF(CFS) =    6.26
 TOTAL AREA(ACRES) =       2.15   TOTAL RUNOFF(CFS) =    7.39
 TC(MIN.) =   6.92

****************************************************************************
 FLOW PROCESS FROM NODE   2401.00 TO NODE   2400.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1130.00  DOWNSTREAM(FEET) =    805.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1330.00   CHANNEL SLOPE =  0.2444
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1781 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      7.39
 FLOW VELOCITY(FEET/SEC) =   4.60 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   4.82   Tc(MIN.) =  11.74
 LONGEST FLOWPATH FROM NODE   2403.00 TO NODE   2400.00 =  1730.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2401.00 TO NODE   2400.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.318
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4430
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4441
 SUBAREA AREA(ACRES) =    31.33   SUBAREA RUNOFF(CFS) =   73.81
 TOTAL AREA(ACRES) =      33.48   TOTAL RUNOFF(CFS) =   79.07
 TC(MIN.) =  11.74

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

```
 FLOW PROCESS FROM NODE    2400.00 TO NODE      24.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   805.00  DOWNSTREAM(FEET) =   803.00
 FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.024
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.69
 (PIPE FLOW VELOCITY CORRESPONDING TO NORMAL-DEPTH FLOW
  AT DEPTH = 0.94 * DIAMETER)
 GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     79.07
 PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =  11.82
 LONGEST FLOWPATH FROM NODE   2403.00 TO NODE     24.00 =  1780.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =     33.48  TC(MIN.) =     11.82
 PEAK FLOW RATE(CFS)    =     79.07
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Job #:
2469.01A

Date:
October 2006

Run Name:
MER241-P

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Land Use	Runoff Coeff.	Area (ac.)	Comments
2415	2414	2	980.0	950.0	100.0	21	0.30	0.08	
2414	2413	5	950.0	875.0	300.0				
2414	2413	8				21	0.30	1.43	
2413	2412	5	875.0	845.0	255.0				
2413	2412	8				7	0.78	1.91	
2412	2411	3	842.0	835.0	275.0				
2412	2411	8				7	0.78	3.44	
2411	2410	3	834.9	802.0	260.0				
2411	2410	8				7	0.78	3.47	
2410.1	2410	8				7	0.78	2.09	
2410	24.1	3	802.0	800.0	235.0				Outlet to Earthen Channel
								12.42	Total Area

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

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                              Analysis prepared by:

                        FUSCOE ENGINEERING - SAN DIEGO, INC.
                          6390 GREENWICH DRIVE, SUITE 170
                            SAN DIEGO, CALIFORNIA 92122
                                  (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 24.1                                                         *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MER241-P.DAT
  TIME/DATE OF STUDY: 09:29 10/02/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   2415.00 TO NODE   2414.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    980.00
  DOWNSTREAM ELEVATION(FEET) =    950.00
  ELEVATION DIFFERENCE(FEET) =     30.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.684
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.647
SUBAREA RUNOFF(CFS) =      0.18
TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.18

****************************************************************************
FLOW PROCESS FROM NODE   2414.00 TO NODE   2413.00 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    950.00  DOWNSTREAM(FEET) =    875.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.2500
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .1800 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
CHANNEL FLOW THRU SUBAREA(CFS) =      0.18
FLOW VELOCITY(FEET/SEC) =   2.38 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   2.10   Tc(MIN.) =   8.79
LONGEST FLOWPATH FROM NODE   2415.00 TO NODE   2413.00 =   400.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   2414.00 TO NODE   2413.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.409
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3000
SUBAREA AREA(ACRES) =     1.43   SUBAREA RUNOFF(CFS) =     2.75
TOTAL AREA(ACRES) =      1.51   TOTAL RUNOFF(CFS) =    2.90
TC(MIN.) =   8.79

****************************************************************************
FLOW PROCESS FROM NODE   2413.00 TO NODE   2412.00 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    875.00  DOWNSTREAM(FEET) =    845.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   255.00   CHANNEL SLOPE =  0.1176
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .1132 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) =      2.90
FLOW VELOCITY(FEET/SEC) =   2.69 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   1.58   Tc(MIN.) =  10.37
LONGEST FLOWPATH FROM NODE   2415.00 TO NODE   2412.00 =   655.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   2413.00 TO NODE   2412.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.760
*USER SPECIFIED(SUBAREA):
RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7800
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.5681
SUBAREA AREA(ACRES) =     1.91   SUBAREA RUNOFF(CFS) =     8.58
TOTAL AREA(ACRES) =      3.42   TOTAL RUNOFF(CFS) =   11.19
TC(MIN.) =  10.37
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2412.00 TO NODE   2411.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   842.00  DOWNSTREAM(FEET) =   835.00
  FLOW LENGTH(FEET) =   275.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.74
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     11.19
  PIPE TRAVEL TIME(MIN.) =   0.47    Tc(MIN.) =  10.84
  LONGEST FLOWPATH FROM NODE   2415.00 TO NODE   2411.00 =   930.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2412.00 TO NODE   2411.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.598
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6743
  SUBAREA AREA(ACRES) =     3.44   SUBAREA RUNOFF(CFS) =   15.02
  TOTAL AREA(ACRES) =       6.86   TOTAL RUNOFF(CFS) =   25.90
  TC(MIN.) =  10.84

****************************************************************************
  FLOW PROCESS FROM NODE   2411.00 TO NODE   2410.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   834.90  DOWNSTREAM(FEET) =   802.00
  FLOW LENGTH(FEET) =   260.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.90
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     25.90
  PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =  11.04
  LONGEST FLOWPATH FROM NODE   2415.00 TO NODE   2410.00 =  1190.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2411.00 TO NODE   2410.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.533
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7098
  SUBAREA AREA(ACRES) =     3.47   SUBAREA RUNOFF(CFS) =   14.98
  TOTAL AREA(ACRES) =      10.33   TOTAL RUNOFF(CFS) =   40.57
  TC(MIN.) =  11.04

****************************************************************************
  FLOW PROCESS FROM NODE   2410.10 TO NODE   2410.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.533
*USER SPECIFIED(SUBAREA):
RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7800
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.7216
SUBAREA AREA(ACRES) =    2.09   SUBAREA RUNOFF(CFS) =    9.02
TOTAL AREA(ACRES) =     12.42   TOTAL RUNOFF(CFS) =   49.59
TC(MIN.) =  11.04

****************************************************************************
 FLOW PROCESS FROM NODE   2410.00 TO NODE     24.10 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   802.00  DOWNSTREAM(FEET) =   800.00
 FLOW LENGTH(FEET) =   235.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  36.0 INCH PIPE IS  25.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   9.27
 ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     49.59
 PIPE TRAVEL TIME(MIN.) =   0.42    Tc(MIN.) =  11.46
 LONGEST FLOWPATH FROM NODE   2415.00 TO NODE     24.10 =  1425.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     12.42  TC(MIN.) =     11.46
 PEAK FLOW RATE(CFS)   =     49.59
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Job #:
2469.01A

Date:
October 2006

Run Name:
MER242-P

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Land Use	Runoff Coeff.	Area (ac.)	Comments
2422	2421	2	1,075.0	995.0	100.0	21	0.42	0.33	
2421	2420	5	995.0	815.0	995.0				
2421	2420	8				21	0.43	6.99	
2420	24.2	4	806.0	802.0	36.0				Existing 18" CMP Culvert
								7.32	Total Area

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

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                        2003,1985,1981 HYDROLOGY MANUAL
        (c) Copyright 1982-2004 Advanced Engineering Software (aes)
            Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                           Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC
                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 242                                                          *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MER242-P.DAT
  TIME/DATE OF STUDY: 15:25 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   2422.00 TO NODE   2421.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1075.00
  DOWNSTREAM ELEVATION(FEET) =    995.00
  ELEVATION DIFFERENCE(FEET) =     80.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.682
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.492
SUBAREA RUNOFF(CFS) =      1.18
TOTAL AREA(ACRES) =      0.33   TOTAL RUNOFF(CFS) =      1.18

****************************************************************************
 FLOW PROCESS FROM NODE   2421.00 TO NODE   2420.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    995.00  DOWNSTREAM(FEET) =    815.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   995.00   CHANNEL SLOPE =  0.1809
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1505 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      1.18
 FLOW VELOCITY(FEET/SEC) =   2.29 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   7.23   Tc(MIN.) =  12.91
 LONGEST FLOWPATH FROM NODE   2422.00 TO NODE   2420.00 =  1095.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2421.00 TO NODE   2420.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.001
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4300
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4295
 SUBAREA AREA(ACRES) =     6.99   SUBAREA RUNOFF(CFS) =   15.03
 TOTAL AREA(ACRES) =       7.32   TOTAL RUNOFF(CFS) =   15.72
 TC(MIN.) =  12.91

****************************************************************************
 FLOW PROCESS FROM NODE   2420.00 TO NODE     24.20 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   806.00  DOWNSTREAM(FEET) =   802.00
 FLOW LENGTH(FEET) =    36.00   MANNING'S N =  0.024
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  11.47
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     15.72
 PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =  12.97
 LONGEST FLOWPATH FROM NODE   2422.00 TO NODE     24.20 =  1131.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =      7.32  TC(MIN.) =     12.97
 PEAK FLOW RATE(CFS)    =     15.72
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Job #:
2469.01A

Date:
October 2006

Run Name:
MM25-PDB

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Land Use	Runoff Coeff.	Area (ac.)	Comments
2575.2	2575.1	2	1,292.2	1,292.0	100.0	7	0.77	0.13	
2575.1	2575	6	1,292.0	1,288.0	410.0	7	0.77	2.49	
2575	2573	3	1,282.0	1,280.0	240.0				
2574	2573	8				7	0.77	1.61	
2573	2572	3	1,280.0	1,277.0	340.0				
2573	2572	8				7	0.78	3.24	
2572	2570	3	1,277.0	1,274.0	196.0				
2570.1	2570	8				7	0.78	2.57	
2570	2570	1							1 of 2
2571.2	2571.1	2	1,298.3	1,298.1	100.0	7	0.77	0.14	
2571.1	2571	6	1,298.1	1,291.0	355.0	7	0.77	2.22	
2571	2570	3	1,285.0	1,274.0	410.0				
2571	2570	8				7	0.79	2.66	
2570	2570	1							2 of 2
2570	2561	3	1,274.0	1,271.0	160.0				
2561	2561	10							Bank #1
2564.2	2564.1	2	1,294.6	1,294.4	100.0	7	0.77	0.17	
2564.1	2564	6	1,294.4	1,285.0	587.0	7	0.78	3.41	
2564	2562	3	1,280.0	1,276.0	162.0				
2562	2562	1							1 of 2
2563.2	2563.1	2	1,294.7	1,294.5	100.0	7	0.79	0.12	
2563.1	2563	6	1,294.5	1,284.0	410.0	7	0.79	2.39	
2563	2562	3	1,278.0	1,276.0	65.0				
2562	2562	1							2 of 2
2562	2561	3	1,276.0	1,271.0	160.0				
2561	2561	11							ADD Bank # 1
2561	2561	12							Delete Bank #1
2561	2560	3	1,271.0	1,260.0	360.0				
2561	2560	8				7	0.79	3.51	
2560.1	2560	8				7	0.78	1.66	
2560	2554	3	1,260.0	1,205.0	990.0				
2554	2554	1							1 of 2
2555.4	2555.3	2	1,285.3	1,285.1	100.0	7	0.77	0.18	
2555.3	2555.2	6	1,285.1	1,266.0	415.0	7	0.77	2.36	
2552.2	2555.1	3	1,260.0	1,247.0	230.0				
2552.2	2555.1	8				7	0.77	1.5	
2555.1	2555	3	1,247.0	1,239.0	240.0				
2555.1	2555	8				7	0.77	4.16	
2555	2554	3	1,239.0	1,205.0	215.0				
2554	2554	1							2 of 2
2554	2550	3	1,205.0	1,200.0	215.0				
2550.2	2550	8				7	0.78	3.98	
2550.1	2550	8				7	0.77	~~3.03~~ 2.51	
2550	2550	10							Bank #1

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Job #:
2469.01A

Date:
October 2006

Run Name:
MM25-PDB

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Land Use	Runoff Coeff.	Area (ac.)	Comments
2552.4	2552.3	2	1,425.0	1,400.0	100.0	21	0.25	0.2	
2552.4	2552.3	8				21	0.25	2.26	
2552.3	2552.2	5	1,400.0	1,300.0	301.0				
2552.2	2552	3	1,300.0	1,235.0	205.0				
2552.1	2552	8				7	0.77	3.16	
2552	2551	3	1,235.0	1,230.0	330.0				
2551.1	2551	8				7	0.77	2.17	
2551	2551	1							1 of 2
2552.2	2552.1	2	1,263.4	1,263.2	100.0	7	0.77	0.12	
2552.1	2552	6	1,263.2	1,245.0	415.0	7	0.77	2.59	
2552	2551	3	1,240.0	1,230.0	222.0				
2551	2551	1							2 of 2
2551	2550	3	1,230.0	1,200.0	480.0				
2551	2550	8				7	0.77	1.31	
2550	2550	1							1 of 2
2553.2	2553.1	2	1,240.7	1,240.5	100.0	7	0.77	0.11	
2553.1	2553	6	1,240.5	1,236.0	256.0	7	0.77	5.31	
2553	2550	3	1,230.0	1,200.0	800.0				
2250	2250	1							
2550	2550	11							ADD Bank # 1
2550	2550	12							Delete Bank #1
2550	2547	3	1,200.0	1,170.0	340.0				
2550	2547	8				7	0.76	3.6	
2547	2546	5	1,170.0	1,000.0	540.0				
2546	2546	10							Bank #1
2546.7	2546.6	2	1,260.0	1,240.0	100.0	21	0.35	0.11	
2546.6	2546.5	5	1,240.0	1,125.0	265.0				
2546.6	2546.5	8				21	0.30	3.16	
2546.5	2546.1	3	1,120.0	1,080.0	380.0				
2546.1	2546.1	1							1 of 2
2546.4	2546.3	2	1,282.0	1,250.0	100.0	21	0.25	0.16	
2546.3	2546.2	5	1,250.0	1,100.0	345.0				
2546.3	2546.2	8				21	0.25	5.43	
2546.2	2546.1	3	1,100.0	1,080.0	290.0				
2546.1	2546.1	1							2 of 2
2546.1	2546	3	1,080.0	1,000.0	290.0				
2546	2546	11							ADD Bank # 1
2546	2546	12							Delete Bank # 1
2546	2545	5	1,000.0	990.0	345.0				
2547	2545	8				21	0.26	27.06	
2545	2545	1							1 of 2
2545.3	2545.2	2	1,250.0	1,225.0	100.0	21	0.25	0.1	
2545.2	2545.1	5	1,225.0	1,035.0	390.0				
2545.2	2545.1	8				21	0.25	2.19	

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Job #:
2469.01A

Date:
October 2006

Run Name:
MM25-PDB

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Land Use	Runoff Coeff.	Area (ac.)	Comments
2245.1	2545	3	1,035.0	990.0	205.0				
2545	2545	1							2 of 2
2545	2545	7							DET OUT Q = 69.07
2545	2544	5	990.0	945.0	225.0				
2544	2543	3	945.0	925.0	250.0				
2543	2543	1							1 of 2
2543.2	2543.1	2	1,175.0	1,125.0	100.0	21	0.25	0.14	
2543.1	2543	5	1,125.0	930.0	510.0				
2543.1	2543	8				21	0.25	2.53	
2543	2543	1							2 of 2
2543	2542	3	925.0	920.0	480.0				
2543	2542	8				8	0.81	5.88	
2542.1	2542	8				0.7	0.81	1.61	
2542	2542	1							1 of 2
2542.5	2542.4	2	1,275.0	1,225.0	100.0	21	0.25	0.39	
2542.4	2542.3	5	1,225.0	1,025.0	460.0				
2542.4	2542.3	8				21	0.25	3.34	
2542.3	2542.2	5	1,025.0	950.0	530.0				
2542.3	2542.2	8					0.26	13.03	
2542.2	2542	3	950.0	920.0	375.0				
2542	2542	1							2 of 2
2542	2541	3	920.0	890.0	555.0				
2541.1	2541	8				7	0.81	7.31	
2541	2541	1							1 of 2
2541.4	2541.3	2	1,225.0	1,225.0	1,175.0	100	0.25	0.47	
2541.3	2541.2	5	1,175.0	920.0	620.0				
2541.3	2541.2	8				21	0.38	8.03	Weighted C
2541.2	2541	6	915.0	900.0	685.0	7	0.81	6.91	
2541	2541	1							2 of 2
2541	2540	3	895.0	870.0	510.0				
2540	2540	1							1 of 2
2540.3	2540.2	2	1,215.0	1,155.0	100.0	7	0.49	0.2	
2540.2	2540.1	5	1,155.0	900.0	705.0				
2540.2	2540.1	8				7	0.50	8.7	
25440.1	2540	6	900.0	885.0	655.0	7	0.81	6.52	
2540	2540	1							2 of 2
2540	2503	3	885.0	840.0	560.0				
2503	2503	10							Bank # 1
2529.2	2529.1	2	1,295.2	1,295.0	100.0	7	0.77	0.17	
2529.1	2529	6	1,295.0	1,277.0	526.0	7	0.77	4.08	
2529	2527	3	1,271.0	1,260.0	396.0				
2527	2527	1							1 of 2
2528.2	2528.1	2	1,293.4	1,293.2	100.0	7	0.78	0.12	
2528.1	2528	6	1,293.2	1,282.0	335.0	7	0.79	3.14	

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Job Name:
Merriam Mountains - Proposed Hydrology

Job #:
2469.01A

Date:
October 2006

Run Name:
MM25-PDB

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Land Use	Runoff Coeff.	Area (ac.)	Comments
2528	2527	3	1,276.0	1,260.0	266.0				
2527	2527	1							2 of 2
2527	2526	3	1,260.0	1,252.0	191.0				
2527	2526	8	1,317.1	1,316.1	98.1	7	0.77	3.98	
2526	2526	1	1,316.1	1,282.1	803.7				1 of 2
2526.5	2526.4	2	1,324.0	1,323.8	100.0	7	0.77	0.22	
2526.4	2526.3	6	1,323.8	1,296.0	630.0	7	0.77	3.47	
2526.3	2526.2	3	1,296.0	1,270.0	440.0				
2526.3	2526.2	8				7	0.77	3.81	
2526.3	2526.2	3	1,270.0	1,258.0	470.0				
2526.2	2526.1	8				7	0.78	4.65	
2526.1	2526	3	1,258.0	1,252.0	175.0				
2526	2526	1							2 of 2
2526	2522	3	1,252.0	1,240.0	220.0				
2522	2522	10							Memory Bank #2
2524.2	2524.1	2	1,324.2	1,324.0	100.0	7	0.77	0.17	
2524.1	2524	6	1,324.0	1,316.5	345.0	7	0.78	0.98	
2425	2523	3	1,310.0	1,264.0	732.0				
2523	2523	1							1 of 2
2525.2	2525.1	2	1,320.4	1,320.2	100.0	7	0.77	0.13	
2512.1	2525	6	1,320.2	1,311.0	370.0	7	0.77	1.96	
2525	2523	3	1,311.0	1,264.0	545.0				
2523	2523	1							2 of 2
2524	2523	8				7	0.78	6.14	
2523	2522	3	1,264.0	1,240.0	430.0				
2523	2522	8				7	0.77	3.38	
2522	2522	11							Confluence Bank #2
2522	2522	12							Clear Bank #2
2522	2520	3	1,240.0	1,230.0	150.0				
2520	2520	1							1 of 3
2521.2	2521.1	2	1,370.0	1,366.0	100.0	7	0.80	0.29	
2521.1	2521	6	1,366.0	1,285.0	1,015.0	7	0.81	2.21	
2521	2520	3	1,280.0	1,230.0	810.0				
2521	2520	8				7	0.81	2.18	
2520	2520	1							2 of 3
2535	2534	2	1,310.0	1,309.8	100.0	7	0.79	0.32	
2534	2533	6	1,309.8	1,290.0	480.0	7	0.78	5.47	
2533	2531	3	1,283.0	1,267.0	305.0				
2533	2531	8				7	0.77	3.04	
2531	2530	3	1,267.0	1,265.0	70.0				
2530	2520	3	1,265.0	1,230.0	6,150.0				
2520.1	2520	8				7	0.80	3.1	
2520	2520	1							3 of 3
2520	2512	3	1,230.0	1,115.0	565.0				

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Job Name:
Merriam Mountains - Proposed Hydrology

Job #:
2469.01A

Date:
October 2006

Run Name:
MM25-PDB

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Land Use	Runoff Coeff.	Area (ac.)	Comments
2512	2512	1							1 of 2
2512.3	2512.2	2	1,600.0	1,575.0	100.0	21	0.35	0.27	
2512.2	2512.1	5	1,575.0	1,385.0	691.0				
2512.2	2512.1	8				21	0.35	4.03	
2512.1	2512	5	1,385.0	1,115.0	1,165.0				
2512.1	2512	8				21	0.77	28.76	
2512	2512	1							2 of 2
2512	2511	5	1,115.0	1,070.0	430.0				
2511	2510	5	1,070.0	960.0	725.0				
2511	2510	8				21	0.32	34.52	
2510	2508.1	3	960.0	918.0	261.0				
2508.1	2508.1	1							1 of 2
2508.4	2508.3	2	1,300.0	1,250.0	100.0	21	0.35	0.32	
2508.3	2508.2	5	1,250.0	1,125.0	340.0				
2508.3	2508.2	8				21	0.31	2.47	
2508.2	2508.1	5	1,125.0	950.0	515.0				
2508.2	2508.1	8				21	0.27	8.05	
2508.1	2508.1	1							2 of 2
2508.1	2508	3	918.0	915.0	245.0				
2508	2508	1							1 of 2
2509.4	2509.3	2	1,600.0	1,575.0	100.0	21	0.35	0.41	
2509.3	2509.2	5	1,575.0	1,375.0	287.0				
2509.3	2509.2	8				21	0.35	2.22	
2509.2	2509.1	5	1,375.0	1,060.0	840.0				
2509.2	2509.1	8				21	0.34	24.69	
2509.1	2509	5	1,060.0	930.0	957.0				
2509.1	2509	8				21	0.31	40.97	
2509	2508	3	930.0	915.0	575.0				
2508	2508	1							2 of 2
2508	2507	3	915.0	905.0	534.0				
2508	2507	8				8	0.81	10.06	
2507	2507	1							1 of 2
2507.4	2507.3	2	1,125.0	1,105.0	100.0	21	0.30	1.05	
2507.3	2507.2	5	1,105.0	975.0	295.0				
2507.3	2507.2	8				21	0.30	2.32	
2507.2	2507.1	5	975.0	925.0	240.0				
2507.2	2507.1	8				21	0.29	7.52	
2507.1	2507	3	925.0	905.0	370.0				
2507	2507	1							2 of 2
2507	2506	3	905.0	890.0	555.0				
2507	2506	8				8	0.81	5.84	
2506.1	2506	8				21	0.27	5.44	
2506	2504	3	890.0	840.0	500.0				
2506	2504	8				8	0.80	10.93	

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Job #:
2469.01A

Date:
October 2006

Run Name:
MM25-PDB

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Land Use	Runoff Coeff.	Area (ac.)	Comments
2504	2504	1							1 of 3
2503.3	2503.2	2	1,180.0	1,140.0	100.0	21	0.30	0.33	
2503.2	2503.1	5	1,140.0	875.0	560.0				
2503.2	2503.1	8				21	0.29	10.14	
2503.1	2504	5	875.0	840.0	310.0				
2504	2504	1							2 of 3
2505.2	2505.1	2	1,190.0	1,150.0	100.0	21	0.25	0.3	
2505.1	2505	5	1,150.0	925.0	781.0				
2505.1	2505	8				21	0.26	13.57	
2505	2504	6	880.0	860.0	875.0	8	0.81	8.63	
2504	2504	1							3 of 3
2504	2503	5	840.0	835.0	300.0				Channel
2504	2503	8				17	0.39	4.4	
2503	2503	11							ADD Bank #3
2503	2503	12							CLEAR Bank #3
2503	2503	7							DET OUT Q = 543.53 CFS
2503	2502	3	835.0	825.0	165.0				Detention Basin
2502	2502	1							1 of 3
2502.5	2502.4	2	1,175.0	1,150.0	100.0	21	0.25	0.21	
2502.4	2502.3	5	1,150.0	1,075.0	302.0				
2502.4	2502.3	8				21	0.25	2.17	
2502.3	2502.2	5	1,075.0	950.0	640.0				
2502.3	2502.2	8				21	0.25	11.59	
2502.2	2502.1	5	950.0	890.0	430.0				
2502.2	2502.1	8				21	0.25	14.58	
2502.1	2502	5	890.0	830.0	1,040.0				2 of 3
2502	2502	1							
2502.8	2502.7	2	1,180.0	1,175.0	100.0	21	0.30	0.19	
2502.7	2502.6	5	1,175.0	875.0	665.0				
2502.7	2502.6	8				21	0.30	7	
2502.6	2502	6	875.0	830.0	815.0	8	0.81	2.36	
2502	2502	1							3 of 3
2502	2501	5	830.0	825.0	800.0				
2502	2501	8				21	0.28	26.06	
2501	25.01	5	825.0	822.0	490.0				
25.01	25.01	1							1 of 3
25.10	25.09	2	1,180.0	1,160.0	100.0	21	0.30	0.14	
25.09	25.08	5	1,160.0	1,055.0	475.0				
25.09	25.08	8				21	0.30	6.15	
25.08	25.07	5	1,055.0	865.0	675.0				
25.08	25.07	8				21	0.30	10.64	
25.07	25.06	5	865.0	850.0	540.0				
25.07	25.06	8				8	0.81	6.31	
25.06	25.01	5	850.0	822.0	380.0				

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Merriam Mountains - Proposed Hydrology

Job #:
2469.01A

Date:
October 2006

Run Name:
MM25-PDB

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Land Use	Runoff Coeff.	Area (ac.)	Comments
25.01	25.01	1							2 of 3
25.05	25.04	2	1,300.0	1,275.0	100.0	21	0.33	0.09	
25.04	25.03	5	1,275.0	1,050.0	575.0				
25.04	25.03	8				21	0.30	5.1	
25.03	25.02	5	1,050.0	845.0	895.0				
25.03	25.02	8				21	0.30	9.66	
25.02	25.01	3	845.0	822.0	510.0				
25.01	25.01	1							3 of 3
25.01	25	8				21	0.30	8.91	
25.01	25	3	822.0	798.0	375.0				
								557.04	Total Area

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

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                        2003,1985,1981 HYDROLOGY MANUAL
        (c) Copyright 1982-2004 Advanced Engineering Software (aes)
            Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                          Analysis prepared by:

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                         SAN DIEGO, CALIFORNIA 92122
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 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 25 - WITH DETENTION STORAGE ROUTING 25A AND 25B              *
* 2469.01A - OCTOBER 2006                                                 *
 *************************************************************************

  FILE NAME: MM25-PDB.DAT
  TIME/DATE OF STUDY: 13:46 10/03/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   2575.20 TO NODE   2575.10 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1292.20
  DOWNSTREAM ELEVATION(FEET) =   1292.00
  ELEVATION DIFFERENCE(FEET) =      0.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.292
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
```

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          THE MAXIMUM OVERLAND FLOW LENGTH =    50.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.890
SUBAREA RUNOFF(CFS) =      0.89
TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.89

****************************************************************************
 FLOW PROCESS FROM NODE   2575.10 TO NODE   2575.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1292.00  DOWNSTREAM ELEVATION(FEET) = 1288.00
 STREET LENGTH(FEET) =   410.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 16.00

 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(curb-to-curb) =   0.0500
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.13
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.48
   HALFSTREET FLOOD WIDTH(FEET) =   16.00
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    0.97
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.46
 STREET FLOW TRAVEL TIME(MIN.) =   7.04   Tc(MIN.) =  12.33
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.152
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.770
 SUBAREA AREA(ACRES) =    2.49      SUBAREA RUNOFF(CFS) =    9.88
 TOTAL AREA(ACRES) =      2.62        PEAK FLOW RATE(CFS) =      10.39

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.55   HALFSTREET FLOOD WIDTH(FEET) =  18.41
 FLOW VELOCITY(FEET/SEC.) =  1.19   DEPTH*VELOCITY(FT*FT/SEC.) =   0.65
 LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2575.00 =   510.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2575.00 TO NODE   2573.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1282.00  DOWNSTREAM(FEET) =  1280.00
 FLOW LENGTH(FEET) =   240.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.27
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     10.39
 PIPE TRAVEL TIME(MIN.) =   0.64    Tc(MIN.) =  12.97
 LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2573.00 =   750.00 FEET.

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

```
 FLOW PROCESS FROM NODE   2574.00 TO NODE   2573.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.987
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7700
 SUBAREA AREA(ACRES) =     1.61   SUBAREA RUNOFF(CFS) =    6.18
 TOTAL AREA(ACRES) =       4.23   TOTAL RUNOFF(CFS) =   16.24
 TC(MIN.) =  12.97

****************************************************************************
 FLOW PROCESS FROM NODE   2573.00 TO NODE   2572.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1280.00  DOWNSTREAM(FEET) =  1277.00
 FLOW LENGTH(FEET) =   340.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.14
 ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     16.24
 PIPE TRAVEL TIME(MIN.) =   0.79    Tc(MIN.) =  13.76
 LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2572.00 =  1090.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2573.00 TO NODE   2572.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.800
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7800
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7743
 SUBAREA AREA(ACRES) =     3.24   SUBAREA RUNOFF(CFS) =   12.13
 TOTAL AREA(ACRES) =       7.47   TOTAL RUNOFF(CFS) =   27.76
 TC(MIN.) =  13.76

****************************************************************************
 FLOW PROCESS FROM NODE   2572.00 TO NODE   2570.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1277.00  DOWNSTREAM(FEET) =  1274.00
 FLOW LENGTH(FEET) =   196.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.07
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     27.76
 PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =  14.09
 LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2570.00 =  1286.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2570.10 TO NODE   2570.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.728
```

```
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7800
 S.C.S. CURVE NUMBER (AMC II) =  0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7758
 SUBAREA AREA(ACRES) =     2.57   SUBAREA RUNOFF(CFS) =    9.48
 TOTAL AREA(ACRES) =     10.04   TOTAL RUNOFF(CFS) =   36.83
 TC(MIN.) =  14.09

****************************************************************************
 FLOW PROCESS FROM NODE   2570.00 TO NODE   2570.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  14.09
 RAINFALL INTENSITY(INCH/HR) =   4.73
 TOTAL STREAM AREA(ACRES) =    10.04
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     36.83

****************************************************************************
 FLOW PROCESS FROM NODE   2571.20 TO NODE   2571.10 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =  0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1298.30
 DOWNSTREAM ELEVATION(FEET) =   1298.10
 ELEVATION DIFFERENCE(FEET) =      0.20
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.292
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    50.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.890
 SUBAREA RUNOFF(CFS) =      0.96
 TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.96

****************************************************************************
 FLOW PROCESS FROM NODE   2571.10 TO NODE   2571.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1298.10  DOWNSTREAM ELEVATION(FEET) = 1291.00
 STREET LENGTH(FEET) =   355.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 16.00

 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(curb-to-curb) =   0.0500
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.14
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.44
```

```
   HALFSTREET FLOOD WIDTH(FEET) =   15.44
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.23
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.53
 STREET FLOW TRAVEL TIME(MIN.) =   4.82   Tc(MIN.) =  10.11
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.854
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.770
 SUBAREA AREA(ACRES) =     2.22      SUBAREA RUNOFF(CFS) =   10.01
 TOTAL AREA(ACRES) =      2.36        PEAK FLOW RATE(CFS) =      10.64

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.50   HALFSTREET FLOOD WIDTH(FEET) =  16.03
 FLOW VELOCITY(FEET/SEC.) =  1.50   DEPTH*VELOCITY(FT*FT/SEC.) =   0.75
 LONGEST FLOWPATH FROM NODE   2571.20 TO NODE   2571.00 =   455.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2571.00 TO NODE   2570.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1285.00  DOWNSTREAM(FEET) =  1274.00
 FLOW LENGTH(FEET) =   410.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   9.84
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     10.64
 PIPE TRAVEL TIME(MIN.) =   0.69    Tc(MIN.) =  10.81
 LONGEST FLOWPATH FROM NODE   2571.20 TO NODE   2570.00 =   865.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2571.00 TO NODE   2570.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.609
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7806
 SUBAREA AREA(ACRES) =     2.66   SUBAREA RUNOFF(CFS) =   11.79
 TOTAL AREA(ACRES) =      5.02   TOTAL RUNOFF(CFS) =   21.98
 TC(MIN.) =  10.81

****************************************************************************
 FLOW PROCESS FROM NODE   2570.00 TO NODE   2570.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  10.81
 RAINFALL INTENSITY(INCH/HR) =   5.61
 TOTAL STREAM AREA(ACRES) =     5.02
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     21.98

 ** CONFLUENCE DATA **
 STREAM     RUNOFF      Tc       INTENSITY      AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1       36.83    14.09        4.728         10.04
```

```
    2       21.98    10.81        5.609          5.02

  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       50.24     10.81        5.609
      2       55.35     14.09        4.728

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     55.35   Tc(MIN.) =   14.09
  TOTAL AREA(ACRES) =     15.06
  LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2570.00 =  1286.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2570.00 TO NODE   2561.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1274.00  DOWNSTREAM(FEET) =  1271.00
  FLOW LENGTH(FEET) =   160.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  22.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.87
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     55.35
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =  14.29
  LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2561.00 =  1446.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2561.00 TO NODE   2561.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2564.20 TO NODE   2564.10 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1294.60
  DOWNSTREAM ELEVATION(FEET) =   1294.40
  ELEVATION DIFFERENCE(FEET) =      0.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.292
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    50.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.890
  SUBAREA RUNOFF(CFS) =      1.16
  TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      1.16

****************************************************************************
  FLOW PROCESS FROM NODE   2564.10 TO NODE   2564.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
```

```
==============================================================================
  UPSTREAM ELEVATION(FEET) = 1294.40  DOWNSTREAM ELEVATION(FEET) = 1285.00
  STREET LENGTH(FEET) =   587.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 16.00

  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(curb-to-curb) =   0.0500
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.22
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.48
    HALFSTREET FLOOD WIDTH(FEET) =   16.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.27
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.61
  STREET FLOW TRAVEL TIME(MIN.) =   7.70   Tc(MIN.) =  12.99
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.981
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.780
  SUBAREA AREA(ACRES) =     3.41      SUBAREA RUNOFF(CFS) =   13.25
  TOTAL AREA(ACRES) =      3.58        PEAK FLOW RATE(CFS) =      13.90

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.55   HALFSTREET FLOOD WIDTH(FEET) =  18.71
  FLOW VELOCITY(FEET/SEC.) =  1.55   DEPTH*VELOCITY(FT*FT/SEC.) =   0.86
  LONGEST FLOWPATH FROM NODE   2564.20 TO NODE   2564.00 =   687.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2564.00 TO NODE   2562.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1280.00  DOWNSTREAM(FEET) =  1276.00
  FLOW LENGTH(FEET) =   162.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.01
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     13.90
  PIPE TRAVEL TIME(MIN.) =   0.27    Tc(MIN.) =  13.26
  LONGEST FLOWPATH FROM NODE   2564.20 TO NODE   2562.00 =   849.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2562.00 TO NODE   2562.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  13.26
  RAINFALL INTENSITY(INCH/HR) =   4.92
  TOTAL STREAM AREA(ACRES) =     3.58
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     13.90

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

```
 FLOW PROCESS FROM NODE   2563.20 TO NODE   2563.10 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1294.70
 DOWNSTREAM ELEVATION(FEET) =   1294.50
 ELEVATION DIFFERENCE(FEET) =      0.20
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.971
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    50.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.87
 TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.87

****************************************************************************
 FLOW PROCESS FROM NODE   2563.10 TO NODE   2563.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1294.50  DOWNSTREAM ELEVATION(FEET) = 1284.00
 STREET LENGTH(FEET) =   410.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 16.00

 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(curb-to-curb) =   0.0500
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.68
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.43
   HALFSTREET FLOOD WIDTH(FEET) =   15.18
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.38
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.59
 STREET FLOW TRAVEL TIME(MIN.) =   4.96   Tc(MIN.) =   9.93
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.925
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.790
 SUBAREA AREA(ACRES) =    2.39      SUBAREA RUNOFF(CFS) =   11.19
 TOTAL AREA(ACRES) =      2.51        PEAK FLOW RATE(CFS) =      11.75

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.50   HALFSTREET FLOOD WIDTH(FEET) =  16.00
 FLOW VELOCITY(FEET/SEC.) =  1.68   DEPTH*VELOCITY(FT*FT/SEC.) =   0.84
 LONGEST FLOWPATH FROM NODE   2563.20 TO NODE   2563.00 =   510.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2563.00 TO NODE   2562.00 IS CODE =  31
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1278.00  DOWNSTREAM(FEET) =  1276.00
  FLOW LENGTH(FEET) =    65.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.61
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     11.75
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =  10.03
  LONGEST FLOWPATH FROM NODE   2563.20 TO NODE   2562.00 =   575.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2562.00 TO NODE   2562.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  10.03
  RAINFALL INTENSITY(INCH/HR) =   5.89
  TOTAL STREAM AREA(ACRES) =     2.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.75

  ** CONFLUENCE DATA **
  STREAM      RUNOFF       Tc       INTENSITY      AREA
  NUMBER       (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
      1        13.90     13.26        4.916          3.58
      2        11.75     10.03        5.886          2.51

  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        22.26     10.03        5.886
      2        23.71     13.26        4.916

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     23.71   Tc(MIN.) =   13.26
  TOTAL AREA(ACRES) =      6.09
  LONGEST FLOWPATH FROM NODE   2564.20 TO NODE   2562.00 =   849.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2562.00 TO NODE   2561.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1276.00  DOWNSTREAM(FEET) =  1271.00
  FLOW LENGTH(FEET) =   160.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.49
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     23.71
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =  13.47
  LONGEST FLOWPATH FROM NODE   2564.20 TO NODE   2561.00 =  1009.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2561.00 TO NODE   2561.00 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        23.71     13.47        4.865         6.09
  LONGEST FLOWPATH FROM NODE   2564.20 TO NODE   2561.00 =  1009.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM      RUNOFF      Tc       INTENSITY      AREA
  NUMBER       (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
     1        55.35     14.29        4.684        15.06
  LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2561.00 =  1446.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc       INTENSITY
  NUMBER      (CFS)     (MIN.)    (INCH/HOUR)
     1       75.90      13.47         4.865
     2       78.18      14.29         4.684

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     78.18   Tc(MIN.) =   14.29
  TOTAL AREA(ACRES) =     21.15

****************************************************************************
  FLOW PROCESS FROM NODE   2561.00 TO NODE   2561.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2561.00 TO NODE   2560.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1271.00  DOWNSTREAM(FEET) =  1260.00
  FLOW LENGTH(FEET) =   360.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  24.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.69
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     78.18
  PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =  14.65
  LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2560.00 =  1806.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2561.00 TO NODE   2560.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.609
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7808
  SUBAREA AREA(ACRES) =    3.51   SUBAREA RUNOFF(CFS) =   12.78
  TOTAL AREA(ACRES) =     24.66   TOTAL RUNOFF(CFS) =   88.75
  TC(MIN.) =  14.65

****************************************************************************
  FLOW PROCESS FROM NODE   2560.10 TO NODE   2560.00 IS CODE =  81
----------------------------------------------------------------------------
```

```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.609
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7807
  SUBAREA AREA(ACRES) =     1.66   SUBAREA RUNOFF(CFS) =     5.97
  TOTAL AREA(ACRES) =      26.32   TOTAL RUNOFF(CFS) =    94.72
  TC(MIN.) =  14.65

********************************************************************************
  FLOW PROCESS FROM NODE   2560.00 TO NODE   2554.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1260.00  DOWNSTREAM(FEET) =  1205.00
  FLOW LENGTH(FEET) =   990.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  22.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.12
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     94.72
  PIPE TRAVEL TIME(MIN.) =   0.75    Tc(MIN.) =  15.40
  LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2554.00 =  2796.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE   2554.00 TO NODE   2554.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  15.40
  RAINFALL INTENSITY(INCH/HR) =   4.46
  TOTAL STREAM AREA(ACRES) =    26.32
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     94.72

********************************************************************************
  FLOW PROCESS FROM NODE   2555.40 TO NODE   2555.30 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1285.30
  DOWNSTREAM ELEVATION(FEET) =   1285.10
  ELEVATION DIFFERENCE(FEET) =      0.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.292
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    50.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.890
  SUBAREA RUNOFF(CFS) =      1.23
  TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      1.23

********************************************************************************
  FLOW PROCESS FROM NODE   2555.30 TO NODE   2555.20 IS CODE =  61
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>(STANDARD CURB SECTION USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1285.10  DOWNSTREAM ELEVATION(FEET) = 1266.00
  STREET LENGTH(FEET) =   415.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 16.00

  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(curb-to-curb) =   0.0500
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.96
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.40
    HALFSTREET FLOOD WIDTH(FEET) =   13.72
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.74
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.70
  STREET FLOW TRAVEL TIME(MIN.) =   3.98   Tc(MIN.) =   9.27
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.194
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.770
  SUBAREA AREA(ACRES) =     2.36      SUBAREA RUNOFF(CFS) =   11.26
  TOTAL AREA(ACRES) =      2.54        PEAK FLOW RATE(CFS) =      12.11

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.47   HALFSTREET FLOOD WIDTH(FEET) =  16.00
  FLOW VELOCITY(FEET/SEC.) =  2.03   DEPTH*VELOCITY(FT*FT/SEC.) =   0.95
  LONGEST FLOWPATH FROM NODE   2555.40 TO NODE   2555.20 =   515.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2555.20 TO NODE   2555.10 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1260.00  DOWNSTREAM(FEET) =  1247.00
  FLOW LENGTH(FEET) =   230.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.48
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     12.11
  PIPE TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =   9.55
  LONGEST FLOWPATH FROM NODE   2555.40 TO NODE   2555.10 =   745.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2555.20 TO NODE   2555.10 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.074
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7700
  SUBAREA AREA(ACRES) =     1.50   SUBAREA RUNOFF(CFS) =    7.02
  TOTAL AREA(ACRES) =      4.04   TOTAL RUNOFF(CFS) =   18.90
```

```
 TC(MIN.) =   9.55

****************************************************************************
 FLOW PROCESS FROM NODE   2555.10 TO NODE   2555.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1247.00  DOWNSTREAM(FEET) =  1239.00
 FLOW LENGTH(FEET) =   240.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  12.30
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     18.90
 PIPE TRAVEL TIME(MIN.) =   0.33    Tc(MIN.) =   9.88
 LONGEST FLOWPATH FROM NODE   2555.40 TO NODE   2555.00 =   985.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2555.10 TO NODE   2555.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.944
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7700
 SUBAREA AREA(ACRES) =     4.16   SUBAREA RUNOFF(CFS) =   19.04
 TOTAL AREA(ACRES) =       8.20   TOTAL RUNOFF(CFS) =   37.53
 TC(MIN.) =   9.88

****************************************************************************
 FLOW PROCESS FROM NODE   2555.00 TO NODE   2554.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1239.00  DOWNSTREAM(FEET) =  1205.00
 FLOW LENGTH(FEET) =   215.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  25.51
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     37.53
 PIPE TRAVEL TIME(MIN.) =   0.14    Tc(MIN.) =  10.02
 LONGEST FLOWPATH FROM NODE   2555.40 TO NODE   2554.00 =  1200.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2554.00 TO NODE   2554.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  10.02
 RAINFALL INTENSITY(INCH/HR) =   5.89
 TOTAL STREAM AREA(ACRES) =     8.20
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     37.53

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc       INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
    1       94.72     15.40         4.464         26.32
```

```
    2       37.53    10.02         5.890          8.20

  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       99.15     10.02        5.890
      2      123.16     15.40        4.464

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    123.16   Tc(MIN.) =   15.40
  TOTAL AREA(ACRES) =     34.52
  LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2554.00 =  2796.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2554.00 TO NODE   2550.00 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) =  1200.00
  FLOW LENGTH(FEET) =   215.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  29.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.97
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    123.16
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =  15.61
  LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2550.00 =  3011.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2550.20 TO NODE   2550.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.425
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7784
  SUBAREA AREA(ACRES) =    3.98   SUBAREA RUNOFF(CFS) =   13.74
  TOTAL AREA(ACRES) =     38.50   TOTAL RUNOFF(CFS) =  132.60
  TC(MIN.) =  15.61

****************************************************************************
  FLOW PROCESS FROM NODE   2550.10 TO NODE   2550.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.425
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7778
  SUBAREA AREA(ACRES) =    3.03   SUBAREA RUNOFF(CFS) =   10.32
  TOTAL AREA(ACRES) =     41.53   TOTAL RUNOFF(CFS) =  142.93
  TC(MIN.) =  15.61

****************************************************************************
  FLOW PROCESS FROM NODE   2550.00 TO NODE   2550.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
```

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

**************************************************************************
 FLOW PROCESS FROM NODE   2552.40 TO NODE   2552.30 IS CODE =  21
--------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1425.00
 DOWNSTREAM ELEVATION(FEET) =   1400.00
 ELEVATION DIFFERENCE(FEET) =     25.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
 SUBAREA RUNOFF(CFS) =      0.37
 TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      0.37

**************************************************************************
 FLOW PROCESS FROM NODE   2552.40 TO NODE   2552.30 IS CODE =  81
--------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =    2.26   SUBAREA RUNOFF(CFS) =    4.15
 TOTAL AREA(ACRES) =      2.46   TOTAL RUNOFF(CFS) =    4.52
 TC(MIN.) =   7.10

**************************************************************************
 FLOW PROCESS FROM NODE   2552.30 TO NODE   2552.20 IS CODE =  53
--------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1400.00  DOWNSTREAM(FEET) =   1300.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   301.00   CHANNEL SLOPE =  0.3322
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2021 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      4.52
 FLOW VELOCITY(FEET/SEC) =   4.16 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.21   Tc(MIN.) =   8.31
 LONGEST FLOWPATH FROM NODE   2552.40 TO NODE   2552.20 =   401.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE   2552.20 TO NODE   2552.00 IS CODE =  31
--------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1300.00  DOWNSTREAM(FEET) =  1235.00
 FLOW LENGTH(FEET) =   205.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  19.05
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      4.52
 PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =   8.49
```

```
 LONGEST FLOWPATH FROM NODE   2552.40 TO NODE   2552.00 =   606.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2552.10 TO NODE   2552.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.555
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5424
 SUBAREA AREA(ACRES) =     3.16   SUBAREA RUNOFF(CFS) =   15.95
 TOTAL AREA(ACRES) =       5.62   TOTAL RUNOFF(CFS) =   19.98
 TC(MIN.) =   8.49

****************************************************************************
 FLOW PROCESS FROM NODE   2552.00 TO NODE   2551.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1235.00  DOWNSTREAM(FEET) =  1230.00
 FLOW LENGTH(FEET) =   330.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   9.24
 ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     19.98
 PIPE TRAVEL TIME(MIN.) =   0.60    Tc(MIN.) =   9.08
 LONGEST FLOWPATH FROM NODE   2552.40 TO NODE   2551.00 =   936.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2551.10 TO NODE   2551.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.275
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.6058
 SUBAREA AREA(ACRES) =     2.17   SUBAREA RUNOFF(CFS) =   10.48
 TOTAL AREA(ACRES) =       7.79   TOTAL RUNOFF(CFS) =   29.61
 TC(MIN.) =   9.08

****************************************************************************
 FLOW PROCESS FROM NODE   2551.00 TO NODE   2551.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   9.08
 RAINFALL INTENSITY(INCH/HR) =   6.27
 TOTAL STREAM AREA(ACRES) =     7.79
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     29.61

****************************************************************************
 FLOW PROCESS FROM NODE   2552.20 TO NODE   2552.10 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
```

```
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =  0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =  100.00
 UPSTREAM ELEVATION(FEET) =  1263.40
 DOWNSTREAM ELEVATION(FEET) =  1263.20
 ELEVATION DIFFERENCE(FEET) =  0.20
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =  5.292
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =  50.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.890
 SUBAREA RUNOFF(CFS) =  0.82
 TOTAL AREA(ACRES) =  0.12  TOTAL RUNOFF(CFS) =  0.82

****************************************************************************
 FLOW PROCESS FROM NODE  2552.10 TO NODE  2552.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1263.20  DOWNSTREAM ELEVATION(FEET) = 1245.00
 STREET LENGTH(FEET) =  415.00  CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 16.00

 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(curb-to-curb) =  0.0500
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =  0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =  7.09
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.41
   HALFSTREET FLOOD WIDTH(FEET) =  13.98
   AVERAGE FLOW VELOCITY(FEET/SEC.) =  1.71
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =  0.69
 STREET FLOW TRAVEL TIME(MIN.) =  4.04  Tc(MIN.) =  9.34
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.164
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =  0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.770
 SUBAREA AREA(ACRES) =  2.59  SUBAREA RUNOFF(CFS) =  12.29
 TOTAL AREA(ACRES) =  2.71  PEAK FLOW RATE(CFS) =  12.86

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.47  HALFSTREET FLOOD WIDTH(FEET) =  16.00
 FLOW VELOCITY(FEET/SEC.) =  2.05  DEPTH*VELOCITY(FT*FT/SEC.) =  0.97
 LONGEST FLOWPATH FROM NODE  2552.20 TO NODE  2552.00 =  515.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  2552.00 TO NODE  2551.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1240.00  DOWNSTREAM(FEET) =  1230.00
 FLOW LENGTH(FEET) =  222.00  MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
```

```
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  12.55
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     12.86
 PIPE TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =   9.63
 LONGEST FLOWPATH FROM NODE   2552.20 TO NODE   2551.00 =   737.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2551.00 TO NODE   2551.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   9.63
 RAINFALL INTENSITY(INCH/HR) =   6.04
 TOTAL STREAM AREA(ACRES) =     2.71
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.86

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY      AREA
 NUMBER       (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
    1        29.61     9.08        6.275          7.79
    2        12.86     9.63        6.042          2.71

 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        41.74     9.08        6.275
    2        41.38     9.63        6.042

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     41.74   Tc(MIN.) =    9.08
 TOTAL AREA(ACRES) =     10.50
 LONGEST FLOWPATH FROM NODE   2552.40 TO NODE   2551.00 =   936.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2551.00 TO NODE   2550.00 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) =  1200.00
 FLOW LENGTH(FEET) =   480.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  18.88
 ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     41.74
 PIPE TRAVEL TIME(MIN.) =   0.42    Tc(MIN.) =   9.51
 LONGEST FLOWPATH FROM NODE   2552.40 TO NODE   2550.00 =  1416.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2551.00 TO NODE   2550.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.093
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6617
  SUBAREA AREA(ACRES) =     1.31   SUBAREA RUNOFF(CFS) =     6.15
  TOTAL AREA(ACRES) =      11.81   TOTAL RUNOFF(CFS) =    47.61
  TC(MIN.) =    9.51

****************************************************************************
  FLOW PROCESS FROM NODE    2550.00 TO NODE    2550.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.51
  RAINFALL INTENSITY(INCH/HR) =    6.09
  TOTAL STREAM AREA(ACRES) =    11.81
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      47.61

****************************************************************************
  FLOW PROCESS FROM NODE    2553.20 TO NODE    2553.10 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1240.70
  DOWNSTREAM ELEVATION(FEET) =   1240.50
  ELEVATION DIFFERENCE(FEET) =      0.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.292
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    50.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.890
  SUBAREA RUNOFF(CFS) =      0.75
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.75

****************************************************************************
  FLOW PROCESS FROM NODE    2553.10 TO NODE    2553.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1240.50  DOWNSTREAM ELEVATION(FEET) = 1236.00
  STREET LENGTH(FEET) =   256.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 16.00

  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(curb-to-curb) =   0.0500
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      15.03
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.56
    HALFSTREET FLOOD WIDTH(FEET) =   19.02
```

```
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.64
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.92
 STREET FLOW TRAVEL TIME(MIN.) =   2.61   Tc(MIN.) =   7.90
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.865
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.770
 SUBAREA AREA(ACRES) =     5.31      SUBAREA RUNOFF(CFS) =   28.07
 TOTAL AREA(ACRES) =       5.42        PEAK FLOW RATE(CFS) =      28.65

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.67   HALFSTREET FLOOD WIDTH(FEET) =  24.51
 FLOW VELOCITY(FEET/SEC.) =  2.05   DEPTH*VELOCITY(FT*FT/SEC.) =   1.37
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  256.0 FT WITH ELEVATION-DROP =   4.5 FT, IS   37.7 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   2553.00
 LONGEST FLOWPATH FROM NODE   2553.20 TO NODE   2553.00 =   356.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2553.00 TO NODE   2550.00 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) =  1200.00
 FLOW LENGTH(FEET) =   800.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  16.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  13.79
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     28.65
 PIPE TRAVEL TIME(MIN.) =   0.97    Tc(MIN.) =   8.87
 LONGEST FLOWPATH FROM NODE   2553.20 TO NODE   2550.00 =  1156.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2550.00 TO NODE   2550.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   8.87
 RAINFALL INTENSITY(INCH/HR) =   6.37
 TOTAL STREAM AREA(ACRES) =     5.42
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     28.65

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY      AREA
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
     1        47.61      9.51         6.093         11.81
     2        28.65      8.87         6.373          5.42

 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        74.18      8.87         6.373
     2        75.01      9.51         6.093

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```

```
 PEAK FLOW RATE(CFS) =     75.01   Tc(MIN.) =    9.51
 TOTAL AREA(ACRES) =     17.23
 LONGEST FLOWPATH FROM NODE   2552.40 TO NODE   2550.00 =  1416.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2550.00 TO NODE   2550.00 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       75.01     9.51       6.093       17.23
 LONGEST FLOWPATH FROM NODE   2552.40 TO NODE   2550.00 =  1416.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF     Tc      INTENSITY     AREA
 NUMBER      (CFS)   (MIN.)   (INCH/HOUR)   (ACRE)
    1      142.93    15.61       4.425       41.53
 LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2550.00 =  3011.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc      INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
    1      162.05       9.51       6.093
    2      197.40      15.61       4.425

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    197.40   Tc(MIN.) =   15.61
 TOTAL AREA(ACRES) =     58.76

****************************************************************************
 FLOW PROCESS FROM NODE   2550.00 TO NODE   2550.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2550.00 TO NODE   2547.00 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) =  1170.00
 FLOW LENGTH(FEET) =   340.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  31.47
 ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    197.40
 PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =  15.79
 LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2547.00 =  3351.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2550.00 TO NODE   2547.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.392
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7541
```

```
 SUBAREA AREA(ACRES) =     3.60   SUBAREA RUNOFF(CFS) =    12.02
 TOTAL AREA(ACRES) =      62.36   TOTAL RUNOFF(CFS) =   206.55
 TC(MIN.) =  15.79

****************************************************************************
 FLOW PROCESS FROM NODE    2547.00 TO NODE    2546.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1170.00  DOWNSTREAM(FEET) =   1000.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   540.00   CHANNEL SLOPE =  0.3148
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1987 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =    206.55
 FLOW VELOCITY(FEET/SEC) =  14.73 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   0.61   Tc(MIN.) =  16.40
 LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2546.00 =  3891.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    2546.00 TO NODE    2546.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    2546.70 TO NODE    2546.60 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) =   1260.00
 DOWNSTREAM ELEVATION(FEET) =   1240.00
 ELEVATION DIFFERENCE(FEET) =     20.00
 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) =  7.972
 SUBAREA RUNOFF(CFS) =      0.31
 TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.31

****************************************************************************
 FLOW PROCESS FROM NODE    2546.60 TO NODE    2546.50 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1240.00  DOWNSTREAM(FEET) =   1125.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   265.00   CHANNEL SLOPE =  0.4340
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2181 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.31
 FLOW VELOCITY(FEET/SEC) =   2.62 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.69   Tc(MIN.) =   7.96
 LONGEST FLOWPATH FROM NODE   2546.70 TO NODE   2546.50 =   365.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    2546.60 TO NODE    2546.50 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.835
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3017
SUBAREA AREA(ACRES) =     3.16   SUBAREA RUNOFF(CFS) =     6.48
TOTAL AREA(ACRES) =       3.27   TOTAL RUNOFF(CFS) =    6.74
TC(MIN.) =   7.96

****************************************************************************
FLOW PROCESS FROM NODE   2546.50 TO NODE   2546.10 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =  1120.00  DOWNSTREAM(FEET) =  1080.00
FLOW LENGTH(FEET) =   380.00   MANNING'S N =  0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.6 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =  14.45
ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =      6.74
PIPE TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =   8.39
LONGEST FLOWPATH FROM NODE   2546.70 TO NODE   2546.10 =   745.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   2546.10 TO NODE   2546.10 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
TIME OF CONCENTRATION(MIN.) =   8.39
RAINFALL INTENSITY(INCH/HR) =   6.60
TOTAL STREAM AREA(ACRES) =     3.27
PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.74

****************************************************************************
FLOW PROCESS FROM NODE   2546.40 TO NODE   2546.30 IS CODE =  21
----------------------------------------------------------------------------
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
S.C.S. CURVE NUMBER (AMC II) =   0
INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
UPSTREAM ELEVATION(FEET) =   1282.00
DOWNSTREAM ELEVATION(FEET) =   1250.00
ELEVATION DIFFERENCE(FEET) =     32.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
SUBAREA RUNOFF(CFS) =      0.29
TOTAL AREA(ACRES) =      0.16   TOTAL RUNOFF(CFS) =      0.29

****************************************************************************
FLOW PROCESS FROM NODE   2546.30 TO NODE   2546.20 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1250.00  DOWNSTREAM(FEET) =   1100.00
```

```
 CHANNEL LENGTH THRU SUBAREA(FEET) =   345.00   CHANNEL SLOPE =  0.4348
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2182 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.29
 FLOW VELOCITY(FEET/SEC) =   2.62 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.20   Tc(MIN.) =   9.30
 LONGEST FLOWPATH FROM NODE   2546.40 TO NODE   2546.20 =   445.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2546.30 TO NODE   2546.20 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.180
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =     5.43   SUBAREA RUNOFF(CFS) =    8.39
 TOTAL AREA(ACRES) =       5.59   TOTAL RUNOFF(CFS) =    8.64
 TC(MIN.) =   9.30

****************************************************************************
 FLOW PROCESS FROM NODE   2546.20 TO NODE   2546.10 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1100.00  DOWNSTREAM(FEET) =  1080.00
 FLOW LENGTH(FEET) =   290.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  13.29
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      8.64
 PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =   9.66
 LONGEST FLOWPATH FROM NODE   2546.40 TO NODE   2546.10 =   735.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2546.10 TO NODE   2546.10 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   9.66
 RAINFALL INTENSITY(INCH/HR) =   6.03
 TOTAL STREAM AREA(ACRES) =     5.59
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.64

 ** CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY      AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
    1         6.74     8.39        6.602         3.27
    2         8.64     9.66        6.029         5.59

 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        14.24      8.39        6.602
      2        14.79      9.66        6.029

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     14.79   Tc(MIN.) =    9.66
  TOTAL AREA(ACRES) =      8.86
  LONGEST FLOWPATH FROM NODE   2546.70 TO NODE   2546.10 =   745.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2546.10 TO NODE   2546.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1080.00  DOWNSTREAM(FEET) =  1000.00
  FLOW LENGTH(FEET) =   290.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  25.47
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     14.79
  PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =   9.85
  LONGEST FLOWPATH FROM NODE   2546.70 TO NODE   2546.00 =  1035.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2546.00 TO NODE   2546.00 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        14.79      9.85        5.953         8.86
  LONGEST FLOWPATH FROM NODE   2546.70 TO NODE   2546.00 =  1035.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM      RUNOFF      Tc       INTENSITY      AREA
  NUMBER       (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
      1       206.55     16.40        4.286        62.36
  LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2546.00 =  3891.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc       INTENSITY
  NUMBER      (CFS)     (MIN.)    (INCH/HOUR)
      1      138.90       9.85         5.953
      2      217.20      16.40         4.286

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    217.20   Tc(MIN.) =   16.40
  TOTAL AREA(ACRES) =     71.22

****************************************************************************
  FLOW PROCESS FROM NODE   2546.00 TO NODE   2546.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2546.00 TO NODE   2545.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1000.00  DOWNSTREAM(FEET) =    990.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   345.00   CHANNEL SLOPE =  0.0290
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0290 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    217.20
  FLOW VELOCITY(FEET/SEC) =   5.72 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.01   Tc(MIN.) =  17.41
  LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2545.00 =  4236.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2547.00 TO NODE   2545.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.125
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5743
  SUBAREA AREA(ACRES) =   27.06   SUBAREA RUNOFF(CFS) =   29.02
  TOTAL AREA(ACRES) =     98.28   TOTAL RUNOFF(CFS) =  232.82
  TC(MIN.) =  17.41

****************************************************************************
  FLOW PROCESS FROM NODE   2545.00 TO NODE   2545.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  17.41
  RAINFALL INTENSITY(INCH/HR) =   4.12
  TOTAL STREAM AREA(ACRES) =    98.28
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    232.82

****************************************************************************
  FLOW PROCESS FROM NODE   2545.30 TO NODE   2545.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1250.00
  DOWNSTREAM ELEVATION(FEET) =   1225.00
  ELEVATION DIFFERENCE(FEET) =     25.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
  SUBAREA RUNOFF(CFS) =      0.18
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.18

****************************************************************************
  FLOW PROCESS FROM NODE   2545.20 TO NODE   2545.10 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1225.00  DOWNSTREAM(FEET) =   1035.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   390.00   CHANNEL SLOPE =  0.4872
```

```
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2237 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.18
 FLOW VELOCITY(FEET/SEC) =   2.65 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.45   Tc(MIN.) =   9.56
 LONGEST FLOWPATH FROM NODE   2545.30 TO NODE   2545.10 =   490.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2545.20 TO NODE   2545.10 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.072
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =     2.19   SUBAREA RUNOFF(CFS) =    3.32
 TOTAL AREA(ACRES) =       2.29   TOTAL RUNOFF(CFS) =    3.48
 TC(MIN.) =   9.56

****************************************************************************
 FLOW PROCESS FROM NODE   2545.10 TO NODE   2545.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1035.00  DOWNSTREAM(FEET) =   990.00
 FLOW LENGTH(FEET) =   205.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  15.49
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      3.48
 PIPE TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =   9.78
 LONGEST FLOWPATH FROM NODE   2545.30 TO NODE   2545.00 =   695.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2545.00 TO NODE   2545.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   9.78
 RAINFALL INTENSITY(INCH/HR) =   5.98
 TOTAL STREAM AREA(ACRES) =     2.29
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.48

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY       AREA
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)     (ACRE)
     1       232.82    17.41         4.125          98.28
     2         3.48     9.78         5.984           2.29

 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       134.25      9.78        5.984
      2       235.22     17.41        4.125

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    235.22   Tc(MIN.) =   17.41
  TOTAL AREA(ACRES) =    100.57
  LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2545.00 =  4236.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2545.00 TO NODE   2545.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  17.41   RAIN INTENSITY(INCH/HOUR) =  4.12
  TOTAL AREA(ACRES) =   100.57   TOTAL RUNOFF(CFS) =     69.07

****************************************************************************
  FLOW PROCESS FROM NODE   2545.00 TO NODE   2544.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    990.00  DOWNSTREAM(FEET) =    945.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   225.00   CHANNEL SLOPE =  0.2000
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1600 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     69.07
  FLOW VELOCITY(FEET/SEC) =   9.18 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.41   Tc(MIN.) =  17.82
  LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2544.00 =  4461.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2544.00 TO NODE   2453.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   945.00  DOWNSTREAM(FEET) =   925.00
  FLOW LENGTH(FEET) =   250.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  23.38
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     69.07
  PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =  18.00
  LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2453.00 =  4711.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2453.00 TO NODE   2543.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  18.00
  RAINFALL INTENSITY(INCH/HR) =   4.04
  TOTAL STREAM AREA(ACRES) =   100.57
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     69.07

****************************************************************************
  FLOW PROCESS FROM NODE   2543.20 TO NODE   2543.10 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1175.00
  DOWNSTREAM ELEVATION(FEET) =   1125.00
  ELEVATION DIFFERENCE(FEET) =     50.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
  SUBAREA RUNOFF(CFS) =      0.26
  TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.26

**************************************************************************
  FLOW PROCESS FROM NODE   2543.10 TO NODE   2543.00 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1125.00  DOWNSTREAM(FEET) =    930.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   510.00   CHANNEL SLOPE =  0.3824
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2109 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.26
  FLOW VELOCITY(FEET/SEC) =   2.57 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.31   Tc(MIN.) =  10.41
  LONGEST FLOWPATH FROM NODE   2543.20 TO NODE   2543.00 =   610.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE   2543.10 TO NODE   2543.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.747
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =     2.53   SUBAREA RUNOFF(CFS) =     3.64
  TOTAL AREA(ACRES) =      2.67   TOTAL RUNOFF(CFS) =    3.84
  TC(MIN.) =  10.41

**************************************************************************
  FLOW PROCESS FROM NODE   2543.00 TO NODE   2543.00 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  10.41
  RAINFALL INTENSITY(INCH/HR) =   5.75
  TOTAL STREAM AREA(ACRES) =     2.67
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.84

  ** CONFLUENCE DATA **
  STREAM      RUNOFF       Tc       INTENSITY       AREA
  NUMBER       (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
     1        69.07    18.00         4.037         100.57
     2         3.84    10.41         5.747           2.67
```

```
 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        43.78    10.41       5.747
    2        71.76    18.00       4.037

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     71.76   Tc(MIN.) =   18.00
 TOTAL AREA(ACRES) =    103.24
 LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2543.00 =  4711.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2543.00 TO NODE   2542.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   925.00  DOWNSTREAM(FEET) =   920.00
 FLOW LENGTH(FEET) =   480.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  39.0 INCH PIPE IS  28.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.90
 ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     71.76
 PIPE TRAVEL TIME(MIN.) =   0.73    Tc(MIN.) =  18.73
 LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2542.00 =  5191.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2543.00 TO NODE   2542.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.934
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8100
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2032
 SUBAREA AREA(ACRES) =    5.88   SUBAREA RUNOFF(CFS) =   18.74
 TOTAL AREA(ACRES) =    109.12   TOTAL RUNOFF(CFS) =   87.25
 TC(MIN.) =  18.73

****************************************************************************
 FLOW PROCESS FROM NODE   2542.10 TO NODE   2542.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.934
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .8100
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2121
 SUBAREA AREA(ACRES) =    1.61   SUBAREA RUNOFF(CFS) =    5.13
 TOTAL AREA(ACRES) =    110.73   TOTAL RUNOFF(CFS) =   92.38
 TC(MIN.) =  18.73

****************************************************************************
 FLOW PROCESS FROM NODE   2542.00 TO NODE   2542.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
```

```
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  18.73
 RAINFALL INTENSITY(INCH/HR) =   3.93
 TOTAL STREAM AREA(ACRES) =   110.73
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     92.38

****************************************************************************
 FLOW PROCESS FROM NODE   2542.50 TO NODE   2542.40 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1275.00
 DOWNSTREAM ELEVATION(FEET) =   1225.00
 ELEVATION DIFFERENCE(FEET) =     50.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
 SUBAREA RUNOFF(CFS) =      0.72
 TOTAL AREA(ACRES) =      0.39   TOTAL RUNOFF(CFS) =      0.72

****************************************************************************
 FLOW PROCESS FROM NODE   2542.40 TO NODE   2542.30 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1225.00  DOWNSTREAM(FEET) =   1025.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   460.00   CHANNEL SLOPE =  0.4348
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2182 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.72
 FLOW VELOCITY(FEET/SEC) =   2.62 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.93   Tc(MIN.) =  10.03
 LONGEST FLOWPATH FROM NODE   2542.50 TO NODE   2542.30 =   560.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2542.40 TO NODE   2542.30 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.885
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =     3.34   SUBAREA RUNOFF(CFS) =     4.91
 TOTAL AREA(ACRES) =      3.73   TOTAL RUNOFF(CFS) =    5.49
 TC(MIN.) =  10.03

****************************************************************************
 FLOW PROCESS FROM NODE   2542.30 TO NODE   2542.20 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1025.00  DOWNSTREAM(FEET) =    950.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   530.00   CHANNEL SLOPE =  0.1415
 SLOPE ADJUSTMENT CURVE USED:
```

```
 EFFECTIVE SLOPE = .1293 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      5.49
 FLOW VELOCITY(FEET/SEC) =   3.55 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.49   Tc(MIN.) =  12.52
 LONGEST FLOWPATH FROM NODE   2542.50 TO NODE   2542.20 =  1090.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2542.30 TO NODE   2542.20 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.101
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2578
 SUBAREA AREA(ACRES) =   13.03   SUBAREA RUNOFF(CFS) =   17.28
 TOTAL AREA(ACRES) =     16.76   TOTAL RUNOFF(CFS) =   22.04
 TC(MIN.) =  12.52

****************************************************************************
 FLOW PROCESS FROM NODE   2542.20 TO NODE   2542.00 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) =   920.00
 FLOW LENGTH(FEET) =   375.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  17.65
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     22.04
 PIPE TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =  12.88
 LONGEST FLOWPATH FROM NODE   2542.50 TO NODE   2542.00 =  1465.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2542.00 TO NODE   2542.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  12.88
 RAINFALL INTENSITY(INCH/HR) =   5.01
 TOTAL STREAM AREA(ACRES) =    16.76
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     22.04

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY       AREA
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)     (ACRE)
     1        92.38     18.73         3.934         110.73
     2        22.04     12.88         5.010          16.76

 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        94.58     12.88         5.010
     2       109.69     18.73         3.934
```

```
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    109.69   Tc(MIN.) =   18.73
 TOTAL AREA(ACRES) =    127.49
 LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2542.00 =  5191.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2542.00 TO NODE   2541.00 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) =   890.00
 FLOW LENGTH(FEET) =   555.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  33.0 INCH PIPE IS  25.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  22.33
 ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    109.69
 PIPE TRAVEL TIME(MIN.) =   0.41    Tc(MIN.) =  19.14
 LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2541.00 =  5746.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2541.10 TO NODE   2541.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.879
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .8100
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2502
 SUBAREA AREA(ACRES) =    7.31   SUBAREA RUNOFF(CFS) =   22.97
 TOTAL AREA(ACRES) =    134.80   TOTAL RUNOFF(CFS) =  130.81
 TC(MIN.) =  19.14

****************************************************************************
 FLOW PROCESS FROM NODE   2541.00 TO NODE   2541.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  19.14
 RAINFALL INTENSITY(INCH/HR) =   3.88
 TOTAL STREAM AREA(ACRES) =   134.80
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    130.81

****************************************************************************
 FLOW PROCESS FROM NODE   2541.40 TO NODE   2541.30 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1225.00
 DOWNSTREAM ELEVATION(FEET) =   1175.00
 ELEVATION DIFFERENCE(FEET) =     50.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
 SUBAREA RUNOFF(CFS) =      0.86
 TOTAL AREA(ACRES) =      0.47   TOTAL RUNOFF(CFS) =      0.86
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2541.30 TO NODE   2541.20 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1175.00  DOWNSTREAM(FEET) =    920.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   620.00   CHANNEL SLOPE =  0.4113
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2154 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.86
  FLOW VELOCITY(FEET/SEC) =   2.60 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.98   Tc(MIN.) =  11.08
  LONGEST FLOWPATH FROM NODE   2541.40 TO NODE   2541.20 =   720.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2541.30 TO NODE   2541.20 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.520
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3728
  SUBAREA AREA(ACRES) =    8.03   SUBAREA RUNOFF(CFS) =   16.84
  TOTAL AREA(ACRES) =      8.50   TOTAL RUNOFF(CFS) =   17.49
  TC(MIN.) =  11.08

****************************************************************************
  FLOW PROCESS FROM NODE   2541.20 TO NODE   2541.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  915.00  DOWNSTREAM ELEVATION(FEET) =  900.00
  STREET LENGTH(FEET) =   685.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 16.00

  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(curb-to-curb) =   0.0500
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      29.41
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.66
    HALFSTREET FLOOD WIDTH(FEET) =   23.78
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.22
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.45
  STREET FLOW TRAVEL TIME(MIN.) =   5.15   Tc(MIN.) =  16.23
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.315
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .8100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.569
```

```
  SUBAREA AREA(ACRES) =    6.91      SUBAREA RUNOFF(CFS) =   24.15
  TOTAL AREA(ACRES) =     15.41        PEAK FLOW RATE(CFS) =      37.83

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.70   HALFSTREET FLOOD WIDTH(FEET) =  26.16
  FLOW VELOCITY(FEET/SEC.) =  2.42   DEPTH*VELOCITY(FT*FT/SEC.) =   1.70
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  685.0 FT WITH ELEVATION-DROP =  15.0 FT, IS   51.6 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   2541.00
  LONGEST FLOWPATH FROM NODE   2541.40 TO NODE   2541.00 =  1405.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2541.00 TO NODE   2541.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  16.23
  RAINFALL INTENSITY(INCH/HR) =   4.32
  TOTAL STREAM AREA(ACRES) =    15.41
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     37.83

  ** CONFLUENCE DATA **
  STREAM      RUNOFF       Tc       INTENSITY       AREA
  NUMBER       (CFS)     (MIN.)    (INCH/HOUR)     (ACRE)
      1       130.81     19.14         3.879         134.80
      2        37.83     16.23         4.315          15.41

  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       155.41     16.23         4.315
      2       164.82     19.14         3.879

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    164.82   Tc(MIN.) =   19.14
  TOTAL AREA(ACRES) =    150.21
  LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2541.00 =  5746.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2541.00 TO NODE   2540.00 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) =   870.00
  FLOW LENGTH(FEET) =   510.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  30.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  23.79
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    164.82
  PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =  19.50
  LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2540.00 =  6256.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2540.00 TO NODE   2540.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```

```
==========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  19.50
  RAINFALL INTENSITY(INCH/HR) =   3.83
  TOTAL STREAM AREA(ACRES) =   150.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    164.82

**************************************************************************
  FLOW PROCESS FROM NODE   2540.30 TO NODE   2540.20 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .4900
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1215.00
  DOWNSTREAM ELEVATION(FEET) =   1155.00
  ELEVATION DIFFERENCE(FEET) =     60.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.097
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.108
  SUBAREA RUNOFF(CFS) =      0.89
  TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      0.89

**************************************************************************
  FLOW PROCESS FROM NODE   2540.20 TO NODE   2540.10 IS CODE =  53
--------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1155.00  DOWNSTREAM(FEET) =    900.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   705.00   CHANNEL SLOPE =  0.3617
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2073 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.89
  FLOW VELOCITY(FEET/SEC) =   2.55 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.61   Tc(MIN.) =   9.71
  LONGEST FLOWPATH FROM NODE   2540.30 TO NODE   2540.10 =   805.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE   2540.20 TO NODE   2540.10 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.012
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .5000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4998
  SUBAREA AREA(ACRES) =    8.70   SUBAREA RUNOFF(CFS) =   26.15
  TOTAL AREA(ACRES) =      8.90   TOTAL RUNOFF(CFS) =   26.74
  TC(MIN.) =   9.71

**************************************************************************
  FLOW PROCESS FROM NODE   2540.10 TO NODE   2540.00 IS CODE =  61
--------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
==========================================================================
  UPSTREAM ELEVATION(FEET) =  900.00  DOWNSTREAM ELEVATION(FEET) =  885.00
```

```
 STREET LENGTH(FEET) =   655.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 16.00

 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(curb-to-curb) =   0.0500
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      39.16
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.71
   HALFSTREET FLOOD WIDTH(FEET) =   26.28
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.48
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.75
 STREET FLOW TRAVEL TIME(MIN.) =   4.40   Tc(MIN.) =  14.10
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.724
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .8100
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.631
 SUBAREA AREA(ACRES) =    6.52      SUBAREA RUNOFF(CFS) =   24.95
 TOTAL AREA(ACRES) =     15.42        PEAK FLOW RATE(CFS) =      45.96

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.74   HALFSTREET FLOOD WIDTH(FEET) =  27.87
 FLOW VELOCITY(FEET/SEC.) =  2.63   DEPTH*VELOCITY(FT*FT/SEC.) =   1.94
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  655.0 FT WITH ELEVATION-DROP =  15.0 FT, IS   48.7 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   2540.00
 LONGEST FLOWPATH FROM NODE   2540.30 TO NODE   2540.00 =  1460.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2540.00 TO NODE   2540.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  14.10
 RAINFALL INTENSITY(INCH/HR) =   4.72
 TOTAL STREAM AREA(ACRES) =    15.42
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     45.96

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY       AREA
 NUMBER       (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
     1       164.82    19.50        3.833         150.21
     2        45.96    14.10        4.724          15.42

 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       179.68    14.10        4.724
     2       202.11    19.50        3.833
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    202.11   Tc(MIN.) =   19.50
  TOTAL AREA(ACRES) =    165.63
  LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2540.00 =  6256.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2540.00 TO NODE   2503.00 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) =   840.00
  FLOW LENGTH(FEET) =   560.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  29.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  30.33
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    202.11
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =  19.81
  LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2503.00 =  6816.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2503.00 TO NODE   2503.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2529.20 TO NODE   2529.10 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1295.20
  DOWNSTREAM ELEVATION(FEET) =   1295.00
  ELEVATION DIFFERENCE(FEET) =      0.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.292
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    50.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.890
  SUBAREA RUNOFF(CFS) =      1.16
  TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      1.16

****************************************************************************
  FLOW PROCESS FROM NODE   2529.10 TO NODE   2529.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1295.00  DOWNSTREAM ELEVATION(FEET) = 1277.00
  STREET LENGTH(FEET) =   526.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 16.00

  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(curb-to-curb) =   0.0500
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.67
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.47
   HALFSTREET FLOOD WIDTH(FEET) =   16.00
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.77
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.83
 STREET FLOW TRAVEL TIME(MIN.) =   4.96   Tc(MIN.) =  10.26
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.802
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.770
 SUBAREA AREA(ACRES) =     4.08      SUBAREA RUNOFF(CFS) =   18.23
 TOTAL AREA(ACRES) =       4.25        PEAK FLOW RATE(CFS) =       18.99

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.54   HALFSTREET FLOOD WIDTH(FEET) =  18.23
 FLOW VELOCITY(FEET/SEC.) =  2.21   DEPTH*VELOCITY(FT*FT/SEC.) =   1.20
 LONGEST FLOWPATH FROM NODE   2529.20 TO NODE   2529.00 =   626.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2529.00 TO NODE   2527.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1271.00  DOWNSTREAM(FEET) =  1260.00
 FLOW LENGTH(FEET) =   396.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  11.45
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     18.99
 PIPE TRAVEL TIME(MIN.) =   0.58    Tc(MIN.) =  10.83
 LONGEST FLOWPATH FROM NODE   2529.20 TO NODE   2527.00 =  1022.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2527.00 TO NODE   2527.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  10.83
 RAINFALL INTENSITY(INCH/HR) =   5.60
 TOTAL STREAM AREA(ACRES) =     4.25
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     18.99

****************************************************************************
 FLOW PROCESS FROM NODE   2528.20 TO NODE   2528.10 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7800
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1293.40
 DOWNSTREAM ELEVATION(FEET) =   1293.20
```

```
 ELEVATION DIFFERENCE(FEET) =      0.20
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.131
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    50.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.068
 SUBAREA RUNOFF(CFS) =      0.85
 TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.85

****************************************************************************
 FLOW PROCESS FROM NODE   2528.10 TO NODE   2528.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1293.20  DOWNSTREAM ELEVATION(FEET) = 1282.00
 STREET LENGTH(FEET) =   335.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 16.00

 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(curb-to-curb) =   0.0500
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.18
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.45
   HALFSTREET FLOOD WIDTH(FEET) =   16.00
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.66
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.75
 STREET FLOW TRAVEL TIME(MIN.) =   3.36   Tc(MIN.) =   8.50
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.551
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.790
 SUBAREA AREA(ACRES) =    3.14      SUBAREA RUNOFF(CFS) =   16.25
 TOTAL AREA(ACRES) =      3.26        PEAK FLOW RATE(CFS) =      16.86

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.53   HALFSTREET FLOOD WIDTH(FEET) =  17.43
 FLOW VELOCITY(FEET/SEC.) =  2.10   DEPTH*VELOCITY(FT*FT/SEC.) =   1.11
 LONGEST FLOWPATH FROM NODE   2528.20 TO NODE   2528.00 =   435.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2528.00 TO NODE   2527.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1276.00  DOWNSTREAM(FEET) =  1260.00
 FLOW LENGTH(FEET) =   266.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  14.92
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     16.86
 PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =   8.79
```

```
 LONGEST FLOWPATH FROM NODE   2528.20 TO NODE   2527.00 =   701.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2527.00 TO NODE   2527.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   8.79
 RAINFALL INTENSITY(INCH/HR) =   6.41
 TOTAL STREAM AREA(ACRES) =     3.26
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.86

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY      AREA
 NUMBER       (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        18.99     10.83        5.601          4.25
     2        16.86      8.79        6.407          3.26

 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        32.28      8.79        6.407
     2        33.73     10.83        5.601

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     33.73   Tc(MIN.) =   10.83
 TOTAL AREA(ACRES) =      7.51
 LONGEST FLOWPATH FROM NODE   2529.20 TO NODE   2527.00 =  1022.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2527.00 TO NODE   2526.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1260.00  DOWNSTREAM(FEET) =  1257.00
 FLOW LENGTH(FEET) =   191.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.50
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     33.73
 PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =  11.13
 LONGEST FLOWPATH FROM NODE   2529.20 TO NODE   2526.00 =  1213.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2527.00 TO NODE   2526.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.502
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7756
 SUBAREA AREA(ACRES) =    3.98   SUBAREA RUNOFF(CFS) =   16.86
 TOTAL AREA(ACRES) =     11.49   TOTAL RUNOFF(CFS) =   49.03
 TC(MIN.) =  11.13
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2526.00 TO NODE   2526.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  11.13
  RAINFALL INTENSITY(INCH/HR) =   5.50
  TOTAL STREAM AREA(ACRES) =    11.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     49.03

****************************************************************************
  FLOW PROCESS FROM NODE   2526.50 TO NODE   2526.40 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1324.00
  DOWNSTREAM ELEVATION(FEET) =   1323.80
  ELEVATION DIFFERENCE(FEET) =      0.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.292
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    50.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.890
  SUBAREA RUNOFF(CFS) =      1.51
  TOTAL AREA(ACRES) =      0.22   TOTAL RUNOFF(CFS) =      1.51

****************************************************************************
  FLOW PROCESS FROM NODE   2526.40 TO NODE   2526.30 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1323.80  DOWNSTREAM ELEVATION(FEET) = 1296.00
  STREET LENGTH(FEET) =   630.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 16.00

  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(curb-to-curb) =   0.0500
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.23
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.44
    HALFSTREET FLOOD WIDTH(FEET) =   15.53
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.83
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.80
  STREET FLOW TRAVEL TIME(MIN.) =   5.75   Tc(MIN.) =  11.04
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.531
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.770
  SUBAREA AREA(ACRES) =     3.47      SUBAREA RUNOFF(CFS) =   14.78
  TOTAL AREA(ACRES) =       3.69        PEAK FLOW RATE(CFS) =      15.72

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.50   HALFSTREET FLOOD WIDTH(FEET) =  16.00
  FLOW VELOCITY(FEET/SEC.) =  2.23   DEPTH*VELOCITY(FT*FT/SEC.) =   1.11
  LONGEST FLOWPATH FROM NODE   2526.50 TO NODE   2526.30 =   730.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2526.30 TO NODE   2526.20 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1296.00  DOWNSTREAM(FEET) =  1270.00
  FLOW LENGTH(FEET) =   440.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.59
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     15.72
  PIPE TRAVEL TIME(MIN.) =   0.50    Tc(MIN.) =  11.55
  LONGEST FLOWPATH FROM NODE   2526.50 TO NODE   2526.20 =  1170.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2526.30 TO NODE   2526.20 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.375
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7700
  SUBAREA AREA(ACRES) =     3.81   SUBAREA RUNOFF(CFS) =   15.77
  TOTAL AREA(ACRES) =       7.50   TOTAL RUNOFF(CFS) =   31.04
  TC(MIN.) =  11.55

****************************************************************************
  FLOW PROCESS FROM NODE   2526.20 TO NODE   2526.10 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) =  1258.00
  FLOW LENGTH(FEET) =   470.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  17.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.36
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     31.04
  PIPE TRAVEL TIME(MIN.) =   0.63    Tc(MIN.) =  12.18
  LONGEST FLOWPATH FROM NODE   2526.50 TO NODE   2526.10 =  1640.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2526.20 TO NODE   2526.10 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.193
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7800
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7738
 SUBAREA AREA(ACRES) =     4.65   SUBAREA RUNOFF(CFS) =   18.83
 TOTAL AREA(ACRES) =      12.15   TOTAL RUNOFF(CFS) =   48.82
 TC(MIN.) =  12.18

****************************************************************************
 FLOW PROCESS FROM NODE    2526.10 TO NODE    2526.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1258.00  DOWNSTREAM(FEET) =  1252.00
 FLOW LENGTH(FEET) =   175.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  15.48
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     48.82
 PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =  12.37
 LONGEST FLOWPATH FROM NODE    2526.50 TO NODE    2526.00 =  1815.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    2526.00 TO NODE    2526.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  12.37
 RAINFALL INTENSITY(INCH/HR) =   5.14
 TOTAL STREAM AREA(ACRES) =    12.15
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     48.82

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY       AREA
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)     (ACRE)
     1        49.03     11.13         5.502         11.49
     2        48.82     12.37         5.141         12.15

 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        92.98     11.13         5.502
     2        94.64     12.37         5.141

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     94.64   Tc(MIN.) =   12.37
 TOTAL AREA(ACRES) =     23.64
 LONGEST FLOWPATH FROM NODE    2526.50 TO NODE    2526.00 =  1815.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    2526.00 TO NODE    2522.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1252.00  DOWNSTREAM(FEET) =  1240.00
 FLOW LENGTH(FEET) =   220.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  33.0 INCH PIPE IS  22.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  21.95
```

```
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     94.64
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =  12.54
  LONGEST FLOWPATH FROM NODE   2526.50 TO NODE   2522.00 =  2035.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2522.00 TO NODE   2522.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2524.20 TO NODE   2524.10 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1324.20
  DOWNSTREAM ELEVATION(FEET) =   1324.00
  ELEVATION DIFFERENCE(FEET) =      0.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.292
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    50.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.890
  SUBAREA RUNOFF(CFS) =      1.16
  TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      1.16

****************************************************************************
  FLOW PROCESS FROM NODE   2524.10 TO NODE   2524.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1324.00  DOWNSTREAM ELEVATION(FEET) = 1316.50
  STREET LENGTH(FEET) =   345.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 16.00

  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(curb-to-curb) =   0.0500
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      3.39
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.36
    HALFSTREET FLOOD WIDTH(FEET) =   11.92
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.10
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.40
  STREET FLOW TRAVEL TIME(MIN.) =   5.22   Tc(MIN.) =  10.51
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.710
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.779
```

```
 SUBAREA AREA(ACRES) =     0.98      SUBAREA RUNOFF(CFS) =     4.36
 TOTAL AREA(ACRES) =      1.15        PEAK FLOW RATE(CFS) =       5.11

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.41   HALFSTREET FLOOD WIDTH(FEET) =  14.15
 FLOW VELOCITY(FEET/SEC.) =  1.21   DEPTH*VELOCITY(FT*FT/SEC.) =   0.49
 LONGEST FLOWPATH FROM NODE   2524.20 TO NODE   2524.00 =   445.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2524.00 TO NODE   2523.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1310.00  DOWNSTREAM(FEET) =  1264.00
 FLOW LENGTH(FEET) =   732.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  11.11
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      5.11
 PIPE TRAVEL TIME(MIN.) =   1.10    Tc(MIN.) =  11.61
 LONGEST FLOWPATH FROM NODE   2524.20 TO NODE   2523.00 =  1177.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2523.00 TO NODE   2523.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  11.61
 RAINFALL INTENSITY(INCH/HR) =   5.36
 TOTAL STREAM AREA(ACRES) =     1.15
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.11

****************************************************************************
 FLOW PROCESS FROM NODE   2525.20 TO NODE   2525.10 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1320.40
 DOWNSTREAM ELEVATION(FEET) =   1320.20
 ELEVATION DIFFERENCE(FEET) =      0.20
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.292
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    50.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.890
 SUBAREA RUNOFF(CFS) =      0.89
 TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.89

****************************************************************************
 FLOW PROCESS FROM NODE   2512.10 TO NODE   2525.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
```

```
 UPSTREAM ELEVATION(FEET) = 1320.20  DOWNSTREAM ELEVATION(FEET) = 1311.00
 STREET LENGTH(FEET) =   370.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 16.00

 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(curb-to-curb) =   0.0500
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.43
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.41
   HALFSTREET FLOOD WIDTH(FEET) =   14.07
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.30
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.53
 STREET FLOW TRAVEL TIME(MIN.) =   4.76   Tc(MIN.) =  10.05
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.877
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.770
 SUBAREA AREA(ACRES) =     1.96      SUBAREA RUNOFF(CFS) =    8.87
 TOTAL AREA(ACRES) =      2.09        PEAK FLOW RATE(CFS) =       9.46

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.47   HALFSTREET FLOOD WIDTH(FEET) =  16.00
 FLOW VELOCITY(FEET/SEC.) =  1.54   DEPTH*VELOCITY(FT*FT/SEC.) =   0.72
 LONGEST FLOWPATH FROM NODE   2525.20 TO NODE   2525.00 =   470.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2525.00 TO NODE   2523.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1311.00  DOWNSTREAM(FEET) =  1264.00
 FLOW LENGTH(FEET) =   545.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  14.77
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      9.46
 PIPE TRAVEL TIME(MIN.) =   0.61    Tc(MIN.) =  10.67
 LONGEST FLOWPATH FROM NODE   2525.20 TO NODE   2523.00 =  1015.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2523.00 TO NODE   2523.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  10.67
 RAINFALL INTENSITY(INCH/HR) =   5.66
 TOTAL STREAM AREA(ACRES) =     2.09
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.46

 ** CONFLUENCE DATA **
```

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	5.11	11.61	5.355	1.15
2	9.46	10.67	5.657	2.09

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	14.15	10.67	5.657
2	14.07	11.61	5.355

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 14.15 Tc(MIN.) = 10.67
TOTAL AREA(ACRES) = 3.24
LONGEST FLOWPATH FROM NODE 2524.20 TO NODE 2523.00 = 1177.00 FEET.

****
FLOW PROCESS FROM NODE 2524.00 TO NODE 2523.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.657
*USER SPECIFIED(SUBAREA):
RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7800
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.7776
SUBAREA AREA(ACRES) = 6.14 SUBAREA RUNOFF(CFS) = 27.09
TOTAL AREA(ACRES) = 9.38 TOTAL RUNOFF(CFS) = 41.26
TC(MIN.) = 10.67

****
FLOW PROCESS FROM NODE 2523.00 TO NODE 2522.00 IS CODE = 31

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 1264.00 DOWNSTREAM(FEET) = 1240.00
FLOW LENGTH(FEET) = 430.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 24.0 INCH PIPE IS 16.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 17.98
ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 41.26
PIPE TRAVEL TIME(MIN.) = 0.40 Tc(MIN.) = 11.07
LONGEST FLOWPATH FROM NODE 2524.20 TO NODE 2522.00 = 1607.00 FEET.

****
FLOW PROCESS FROM NODE 2523.00 TO NODE 2522.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.524
*USER SPECIFIED(SUBAREA):
RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.7756
SUBAREA AREA(ACRES) = 3.38 SUBAREA RUNOFF(CFS) = 14.38
TOTAL AREA(ACRES) = 12.76 TOTAL RUNOFF(CFS) = 54.67
TC(MIN.) = 11.07

****

```
 FLOW PROCESS FROM NODE    2522.00 TO NODE    2522.00 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         54.67     11.07        5.524        12.76
 LONGEST FLOWPATH FROM NODE    2524.20 TO NODE    2522.00 =  1607.00 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
 STREAM      RUNOFF      Tc       INTENSITY      AREA
 NUMBER       (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
    1         94.64     12.54        5.097        23.64
 LONGEST FLOWPATH FROM NODE    2526.50 TO NODE    2522.00 =  2035.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF       Tc       INTENSITY
 NUMBER      (CFS)     (MIN.)    (INCH/HOUR)
    1       138.20      11.07        5.524
    2       145.08      12.54        5.097

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    145.08   Tc(MIN.) =   12.54
 TOTAL AREA(ACRES) =     36.40

****************************************************************************
 FLOW PROCESS FROM NODE    2522.00 TO NODE    2522.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    2522.00 TO NODE    2520.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1240.00  DOWNSTREAM(FEET) =  1230.00
 FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  36.0 INCH PIPE IS  26.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  26.11
 ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    145.08
 PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =  12.63
 LONGEST FLOWPATH FROM NODE    2526.50 TO NODE    2520.00 =  2185.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    2520.00 TO NODE    2520.00 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.) =  12.63
 RAINFALL INTENSITY(INCH/HR) =   5.07
 TOTAL STREAM AREA(ACRES) =    36.40
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    145.08

****************************************************************************
 FLOW PROCESS FROM NODE    2521.20 TO NODE    2521.10 IS CODE =  21
----------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .8000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1370.00
  DOWNSTREAM ELEVATION(FEET) =   1366.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.316
  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) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      2.14
  TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      2.14

********************************************************************************
  FLOW PROCESS FROM NODE   2521.10 TO NODE   2521.00 IS CODE =  61
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1366.00  DOWNSTREAM ELEVATION(FEET) = 1285.00
  STREET LENGTH(FEET) =  1015.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 16.00

  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(curb-to-curb) =   0.0500
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.24
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.38
    HALFSTREET FLOOD WIDTH(FEET) =   12.52
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.15
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.81
  STREET FLOW TRAVEL TIME(MIN.) =   7.87   Tc(MIN.) =  11.19
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.485
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .8100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.809
  SUBAREA AREA(ACRES) =    2.21      SUBAREA RUNOFF(CFS) =    9.82
  TOTAL AREA(ACRES) =      2.50        PEAK FLOW RATE(CFS) =      11.09

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.42   HALFSTREET FLOOD WIDTH(FEET) =  14.84
  FLOW VELOCITY(FEET/SEC.) =  2.39   DEPTH*VELOCITY(FT*FT/SEC.) =   1.01
  LONGEST FLOWPATH FROM NODE   2521.20 TO NODE   2521.00 =  1115.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE   2521.00 TO NODE   2520.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1280.00  DOWNSTREAM(FEET) =  1230.00
  FLOW LENGTH(FEET) =   810.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.63
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     11.09
  PIPE TRAVEL TIME(MIN.) =   0.99    Tc(MIN.) =  12.18
  LONGEST FLOWPATH FROM NODE   2521.20 TO NODE   2520.00 =  1925.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2521.00 TO NODE   2520.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.193
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .8100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8094
  SUBAREA AREA(ACRES) =     2.18   SUBAREA RUNOFF(CFS) =    9.17
  TOTAL AREA(ACRES) =       4.68   TOTAL RUNOFF(CFS) =   19.67
  TC(MIN.) =  12.18

****************************************************************************
  FLOW PROCESS FROM NODE   2520.00 TO NODE   2520.00 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.) =  12.18
  RAINFALL INTENSITY(INCH/HR) =   5.19
  TOTAL STREAM AREA(ACRES) =     4.68
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     19.67

****************************************************************************
  FLOW PROCESS FROM NODE   2535.00 TO NODE   2534.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1310.00
  DOWNSTREAM ELEVATION(FEET) =   1309.80
  ELEVATION DIFFERENCE(FEET) =      0.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.971
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    50.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      2.33
  TOTAL AREA(ACRES) =       0.32   TOTAL RUNOFF(CFS) =      2.33

****************************************************************************
  FLOW PROCESS FROM NODE   2534.00 TO NODE   2533.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>(STANDARD CURB SECTION USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1309.80  DOWNSTREAM ELEVATION(FEET) = 1290.00
  STREET LENGTH(FEET) =   480.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 16.00

  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(curb-to-curb) =   0.0500
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.64
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.51
    HALFSTREET FLOOD WIDTH(FEET) =   16.58
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.23
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.14
  STREET FLOW TRAVEL TIME(MIN.) =   3.58   Tc(MIN.) =   8.55
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.522
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.781
  SUBAREA AREA(ACRES) =     5.47      SUBAREA RUNOFF(CFS) =   27.83
  TOTAL AREA(ACRES) =       5.79        PEAK FLOW RATE(CFS) =      29.48

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.60   HALFSTREET FLOOD WIDTH(FEET) =  20.97
  FLOW VELOCITY(FEET/SEC.) =  2.74   DEPTH*VELOCITY(FT*FT/SEC.) =   1.64
  LONGEST FLOWPATH FROM NODE   2535.00 TO NODE   2533.00 =   580.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2533.00 TO NODE   2531.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1283.00  DOWNSTREAM(FEET) =  1267.00
  FLOW LENGTH(FEET) =   305.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.09
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     29.48
  PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =   8.87
  LONGEST FLOWPATH FROM NODE   2535.00 TO NODE   2531.00 =   885.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2533.00 TO NODE   2531.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.371
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7769
  SUBAREA AREA(ACRES) =     3.04   SUBAREA RUNOFF(CFS) =   14.91
  TOTAL AREA(ACRES) =       8.83   TOTAL RUNOFF(CFS) =   43.71
```

```
 TC(MIN.) =   8.87

****************************************************************************
 FLOW PROCESS FROM NODE   2531.00 TO NODE   2530.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1267.00  DOWNSTREAM(FEET) =  1265.00
 FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  14.09
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     43.71
 PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =   8.95
 LONGEST FLOWPATH FROM NODE   2535.00 TO NODE   2530.00 =   955.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2530.00 TO NODE   2520.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1265.00  DOWNSTREAM(FEET) =  1230.00
 FLOW LENGTH(FEET) =   615.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  17.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  18.30
 ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     43.71
 PIPE TRAVEL TIME(MIN.) =   0.56    Tc(MIN.) =   9.51
 LONGEST FLOWPATH FROM NODE   2535.00 TO NODE   2520.00 =  1570.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2520.10 TO NODE   2520.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.090
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .8000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7829
 SUBAREA AREA(ACRES) =    3.10   SUBAREA RUNOFF(CFS) =   15.10
 TOTAL AREA(ACRES) =     11.93   TOTAL RUNOFF(CFS) =   56.88
 TC(MIN.) =   9.51

****************************************************************************
 FLOW PROCESS FROM NODE   2520.00 TO NODE   2520.00 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.) =   9.51
 RAINFALL INTENSITY(INCH/HR) =   6.09
 TOTAL STREAM AREA(ACRES) =    11.93
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     56.88

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY      AREA
 NUMBER       (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
    1       145.08    12.63         5.072         36.40
```

```
     2        19.67     12.18         5.193          4.68
     3        56.88      9.51         6.090         11.93

  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       181.51      9.51        6.090
      2       208.04     12.18        5.193
      3       211.67     12.63        5.072

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    211.67   Tc(MIN.) =   12.63
  TOTAL AREA(ACRES) =     53.01
  LONGEST FLOWPATH FROM NODE   2526.50 TO NODE   2520.00 =  2185.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2520.00 TO NODE   2512.00 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) =  1115.00
  FLOW LENGTH(FEET) =   565.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  25.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  43.31
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    211.67
  PIPE TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =  12.85
  LONGEST FLOWPATH FROM NODE   2526.50 TO NODE   2512.00 =  2750.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2512.00 TO NODE   2512.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  12.85
  RAINFALL INTENSITY(INCH/HR) =   5.02
  TOTAL STREAM AREA(ACRES) =    53.01
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    211.67

****************************************************************************
  FLOW PROCESS FROM NODE   2512.30 TO NODE   2512.20 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) =   1600.00
  DOWNSTREAM ELEVATION(FEET) =   1575.00
  ELEVATION DIFFERENCE(FEET) =     25.00
  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) =  7.972
  SUBAREA RUNOFF(CFS) =      0.75
  TOTAL AREA(ACRES) =      0.27   TOTAL RUNOFF(CFS) =      0.75
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2512.20 TO NODE   2512.10 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1575.00  DOWNSTREAM(FEET) =   1385.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   691.00   CHANNEL SLOPE =  0.2750
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1883 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.75
  FLOW VELOCITY(FEET/SEC) =   2.43 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.74   Tc(MIN.) =  11.01
  LONGEST FLOWPATH FROM NODE   2512.30 TO NODE   2512.10 =   791.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2512.20 TO NODE   2512.10 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.544
  *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) =    4.03   SUBAREA RUNOFF(CFS) =    7.82
  TOTAL AREA(ACRES) =      4.30   TOTAL RUNOFF(CFS) =    8.34
  TC(MIN.) =  11.01

****************************************************************************
  FLOW PROCESS FROM NODE   2512.10 TO NODE   2512.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1385.00  DOWNSTREAM(FEET) =   1115.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1165.00   CHANNEL SLOPE =  0.2318
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1739 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      8.34
  FLOW VELOCITY(FEET/SEC) =   4.73 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.10   Tc(MIN.) =  15.11
  LONGEST FLOWPATH FROM NODE   2512.30 TO NODE   2512.00 =  1956.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2512.10 TO NODE   2512.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.519
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7154
  SUBAREA AREA(ACRES) =   28.76   SUBAREA RUNOFF(CFS) =  100.08
  TOTAL AREA(ACRES) =     33.06   TOTAL RUNOFF(CFS) =  106.88
  TC(MIN.) =  15.11

****************************************************************************
  FLOW PROCESS FROM NODE   2512.00 TO NODE   2512.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```

```
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  15.11
  RAINFALL INTENSITY(INCH/HR) =   4.52
  TOTAL STREAM AREA(ACRES) =    33.06
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    106.88

  ** CONFLUENCE DATA **
  STREAM      RUNOFF       Tc       INTENSITY       AREA
  NUMBER       (CFS)     (MIN.)    (INCH/HOUR)     (ACRE)
      1       211.67     12.85         5.017         53.01
      2       106.88     15.11         4.519         33.06

  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       302.57     12.85         5.017
      2       297.56     15.11         4.519

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    302.57   Tc(MIN.) =   12.85
  TOTAL AREA(ACRES) =     86.07
  LONGEST FLOWPATH FROM NODE   2526.50 TO NODE   2512.00 =  2750.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2512.00 TO NODE   2511.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1115.00  DOWNSTREAM(FEET) =   1070.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   430.00   CHANNEL SLOPE =  0.1047
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1035 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    302.57
  FLOW VELOCITY(FEET/SEC) =  12.07 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.59   Tc(MIN.) =  13.44
  LONGEST FLOWPATH FROM NODE   2526.50 TO NODE   2511.00 =  3180.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2511.00 TO NODE   2510.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1070.00  DOWNSTREAM(FEET) =    960.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   725.00   CHANNEL SLOPE =  0.1517
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1359 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    302.57
  FLOW VELOCITY(FEET/SEC) =  13.83 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.87   Tc(MIN.) =  14.32
  LONGEST FLOWPATH FROM NODE   2526.50 TO NODE   2510.00 =  3905.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2511.00 TO NODE   2510.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.679
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3200
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.6305
SUBAREA AREA(ACRES) =   34.52   SUBAREA RUNOFF(CFS) =   51.68
TOTAL AREA(ACRES) =    120.59   TOTAL RUNOFF(CFS) =  355.74
TC(MIN.) =  14.32

****************************************************************************
FLOW PROCESS FROM NODE   2510.00 TO NODE   2508.10 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   960.00  DOWNSTREAM(FEET) =   918.00
FLOW LENGTH(FEET) =   261.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  42.0 INCH PIPE IS  32.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =  45.20
ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =    355.74
PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =  14.41
LONGEST FLOWPATH FROM NODE   2526.50 TO NODE   2508.10 =  4166.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   2508.10 TO NODE   2508.10 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
TIME OF CONCENTRATION(MIN.) =  14.41
RAINFALL INTENSITY(INCH/HR) =   4.66
TOTAL STREAM AREA(ACRES) =   120.59
PEAK FLOW RATE(CFS) AT CONFLUENCE =    355.74

****************************************************************************
FLOW PROCESS FROM NODE   2508.40 TO NODE   2508.30 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) =   1300.00
DOWNSTREAM ELEVATION(FEET) =   1250.00
ELEVATION DIFFERENCE(FEET) =     50.00
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) =  7.972
SUBAREA RUNOFF(CFS) =      0.89
TOTAL AREA(ACRES) =      0.32   TOTAL RUNOFF(CFS) =      0.89

****************************************************************************
FLOW PROCESS FROM NODE   2508.30 TO NODE   2508.20 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1250.00  DOWNSTREAM(FEET) =   1125.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   340.00   CHANNEL SLOPE =  0.3676
```

```
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2083 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.89
  FLOW VELOCITY(FEET/SEC) =   2.56 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.22   Tc(MIN.) =   8.48
  LONGEST FLOWPATH FROM NODE   2508.40 TO NODE   2508.20 =   440.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2508.30 TO NODE   2508.20 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.557
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3146
  SUBAREA AREA(ACRES) =     2.47   SUBAREA RUNOFF(CFS) =    5.02
  TOTAL AREA(ACRES) =       2.79   TOTAL RUNOFF(CFS) =    5.76
  TC(MIN.) =   8.48

****************************************************************************
  FLOW PROCESS FROM NODE   2508.20 TO NODE   2508.10 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1125.00  DOWNSTREAM(FEET) =    950.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   515.00   CHANNEL SLOPE =  0.3398
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2035 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      5.76
  FLOW VELOCITY(FEET/SEC) =   4.52 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.90   Tc(MIN.) =  10.38
  LONGEST FLOWPATH FROM NODE   2508.40 TO NODE   2508.10 =   955.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2508.20 TO NODE   2508.10 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.757
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2815
  SUBAREA AREA(ACRES) =     8.05   SUBAREA RUNOFF(CFS) =   12.51
  TOTAL AREA(ACRES) =      10.84   TOTAL RUNOFF(CFS) =   17.56
  TC(MIN.) =  10.38

****************************************************************************
  FLOW PROCESS FROM NODE   2508.10 TO NODE   2508.10 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  10.38
  RAINFALL INTENSITY(INCH/HR) =   5.76
  TOTAL STREAM AREA(ACRES) =    10.84
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     17.56
```

```
 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY       AREA
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)     (ACRE)
     1       355.74     14.41         4.658         120.59
     2        17.56     10.38         5.757          10.84

 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       305.44     10.38         5.757
     2       369.95     14.41         4.658

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    369.95   Tc(MIN.) =   14.41
 TOTAL AREA(ACRES) =    131.43
 LONGEST FLOWPATH FROM NODE   2526.50 TO NODE   2508.10 =  4166.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2508.10 TO NODE   2508.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   918.00  DOWNSTREAM(FEET) =   915.00
 FLOW LENGTH(FEET) =   245.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  69.0 INCH PIPE IS  52.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  17.36
 ESTIMATED PIPE DIAMETER(INCH) =  69.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    369.95
 PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =  14.65
 LONGEST FLOWPATH FROM NODE   2526.50 TO NODE   2508.00 =  4411.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2508.00 TO NODE   2508.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  14.65
 RAINFALL INTENSITY(INCH/HR) =   4.61
 TOTAL STREAM AREA(ACRES) =   131.43
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    369.95

****************************************************************************
 FLOW PROCESS FROM NODE   2509.40 TO NODE   2509.30 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) =   1600.00
 DOWNSTREAM ELEVATION(FEET) =   1575.00
 ELEVATION DIFFERENCE(FEET) =     25.00
 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) =  7.972
```

```
 SUBAREA RUNOFF(CFS) =      1.14
 TOTAL AREA(ACRES) =      0.41   TOTAL RUNOFF(CFS) =      1.14

****************************************************************************
 FLOW PROCESS FROM NODE   2509.30 TO NODE   2509.20 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1575.00  DOWNSTREAM(FEET) =   1375.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   287.00   CHANNEL SLOPE =  0.6969
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2300 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      1.14
 FLOW VELOCITY(FEET/SEC) =   2.81 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.70   Tc(MIN.) =   7.97
 LONGEST FLOWPATH FROM NODE   2509.40 TO NODE   2509.20 =   387.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2509.30 TO NODE   2509.20 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.827
 *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) =     2.22   SUBAREA RUNOFF(CFS) =     5.30
 TOTAL AREA(ACRES) =       2.63   TOTAL RUNOFF(CFS) =     6.28
 TC(MIN.) =   7.97

****************************************************************************
 FLOW PROCESS FROM NODE   2509.20 TO NODE   2509.10 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1375.00  DOWNSTREAM(FEET) =   1060.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   840.00   CHANNEL SLOPE =  0.3750
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2096 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      6.28
 FLOW VELOCITY(FEET/SEC) =   4.73 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.96   Tc(MIN.) =  10.93
 LONGEST FLOWPATH FROM NODE   2509.40 TO NODE   2509.10 =  1227.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2509.20 TO NODE   2509.10 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.568
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3400
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3410
 SUBAREA AREA(ACRES) =    24.69   SUBAREA RUNOFF(CFS) =    46.74
 TOTAL AREA(ACRES) =      27.32   TOTAL RUNOFF(CFS) =    51.87
 TC(MIN.) =  10.93

****************************************************************************
 FLOW PROCESS FROM NODE   2509.10 TO NODE   2509.00 IS CODE =  53
```

```
------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1060.00  DOWNSTREAM(FEET) =    930.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   957.00   CHANNEL SLOPE =  0.1358
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1256 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     51.87
  FLOW VELOCITY(FEET/SEC) =   7.39 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.16   Tc(MIN.) =  13.09
  LONGEST FLOWPATH FROM NODE   2509.40 TO NODE   2509.00 =  2184.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2509.10 TO NODE   2509.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.957
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3224
  SUBAREA AREA(ACRES) =   40.97   SUBAREA RUNOFF(CFS) =   62.96
  TOTAL AREA(ACRES) =     68.29   TOTAL RUNOFF(CFS) =  109.14
  TC(MIN.) =  13.09

****************************************************************************
  FLOW PROCESS FROM NODE   2509.00 TO NODE   2508.00 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) =   915.00
  FLOW LENGTH(FEET) =   575.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.16
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    109.14
  PIPE TRAVEL TIME(MIN.) =   0.56    Tc(MIN.) =  13.65
  LONGEST FLOWPATH FROM NODE   2509.40 TO NODE   2508.00 =  2759.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2508.00 TO NODE   2508.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  13.65
  RAINFALL INTENSITY(INCH/HR) =   4.83
  TOTAL STREAM AREA(ACRES) =    68.29
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    109.14

  ** CONFLUENCE DATA **
  STREAM      RUNOFF       Tc       INTENSITY       AREA
  NUMBER       (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
     1        369.95    14.65         4.610         131.43
     2        109.14    13.65         4.825          68.29

  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      462.58    13.65       4.825
     2      474.22    14.65       4.610

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    474.22   Tc(MIN.) =   14.65
 TOTAL AREA(ACRES) =    199.72
 LONGEST FLOWPATH FROM NODE   2526.50 TO NODE   2508.00 =  4411.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2508.00 TO NODE   2507.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   915.00  DOWNSTREAM(FEET) =   905.00
 FLOW LENGTH(FEET) =   534.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  69.0 INCH PIPE IS  54.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  21.53
 ESTIMATED PIPE DIAMETER(INCH) =  69.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    474.22
 PIPE TRAVEL TIME(MIN.) =   0.41    Tc(MIN.) =  15.06
 LONGEST FLOWPATH FROM NODE   2526.50 TO NODE   2507.00 =  4945.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2508.00 TO NODE   2507.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.528
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8100
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5208
 SUBAREA AREA(ACRES) =   10.06   SUBAREA RUNOFF(CFS) =   36.90
 TOTAL AREA(ACRES) =    209.78   TOTAL RUNOFF(CFS) =  494.69
 TC(MIN.) =  15.06

****************************************************************************
 FLOW PROCESS FROM NODE   2507.00 TO NODE   2507.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  15.06
 RAINFALL INTENSITY(INCH/HR) =   4.53
 TOTAL STREAM AREA(ACRES) =   209.78
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    494.69

****************************************************************************
 FLOW PROCESS FROM NODE   2507.40 TO NODE   2507.30 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1125.00
```

```
 DOWNSTREAM ELEVATION(FEET) =   1105.00
 ELEVATION DIFFERENCE(FEET) =     20.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.684
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.647
 SUBAREA RUNOFF(CFS) =      2.41
 TOTAL AREA(ACRES) =      1.05   TOTAL RUNOFF(CFS) =      2.41

****************************************************************************
 FLOW PROCESS FROM NODE   2507.30 TO NODE   2507.20 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1105.00  DOWNSTREAM(FEET) =    975.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   295.00   CHANNEL SLOPE =  0.4407
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2189 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      2.41
 FLOW VELOCITY(FEET/SEC) =   3.51 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.40   Tc(MIN.) =   8.08
 LONGEST FLOWPATH FROM NODE   2507.40 TO NODE   2507.20 =   395.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2507.30 TO NODE   2507.20 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.764
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3000
 SUBAREA AREA(ACRES) =     2.32   SUBAREA RUNOFF(CFS) =     4.71
 TOTAL AREA(ACRES) =      3.37   TOTAL RUNOFF(CFS) =    6.84
 TC(MIN.) =   8.08

****************************************************************************
 FLOW PROCESS FROM NODE   2507.20 TO NODE   2507.10 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    975.00  DOWNSTREAM(FEET) =    925.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   240.00   CHANNEL SLOPE =  0.2083
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1642 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      6.84
 FLOW VELOCITY(FEET/SEC) =   4.30 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   0.93   Tc(MIN.) =   9.01
 LONGEST FLOWPATH FROM NODE   2507.40 TO NODE   2507.10 =   635.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2507.20 TO NODE   2507.10 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.305
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2900
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2931
 SUBAREA AREA(ACRES) =     7.52   SUBAREA RUNOFF(CFS) =   13.75
```

```
 TOTAL AREA(ACRES) =     10.89   TOTAL RUNOFF(CFS) =   20.13
 TC(MIN.) =   9.01

****************************************************************************
 FLOW PROCESS FROM NODE   2507.10 TO NODE   2507.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   925.00  DOWNSTREAM(FEET) =   905.00
 FLOW LENGTH(FEET) =   370.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  14.77
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     20.13
 PIPE TRAVEL TIME(MIN.) =   0.42    Tc(MIN.) =   9.43
 LONGEST FLOWPATH FROM NODE   2507.40 TO NODE   2507.00 =  1005.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2507.00 TO NODE   2507.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   9.43
 RAINFALL INTENSITY(INCH/HR) =   6.12
 TOTAL STREAM AREA(ACRES) =    10.89
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.13

 ** CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY      AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
    1       494.69    15.06        4.528       209.78
    2        20.13     9.43        6.124        10.89

 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       385.90     9.43       6.124
    2       509.57    15.06       4.528

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    509.57   Tc(MIN.) =   15.06
 TOTAL AREA(ACRES) =    220.67
 LONGEST FLOWPATH FROM NODE   2526.50 TO NODE   2507.00 =  4945.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2507.00 TO NODE   2506.00 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) =   890.00
 FLOW LENGTH(FEET) =   555.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  66.0 INCH PIPE IS  52.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  25.12
 ESTIMATED PIPE DIAMETER(INCH) =  66.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    509.57
```

```
 PIPE TRAVEL TIME(MIN.) =   0.37    Tc(MIN.) =  15.43
 LONGEST FLOWPATH FROM NODE   2526.50 TO NODE   2506.00 =  5500.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2507.00 TO NODE   2506.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.458
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8100
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5173
 SUBAREA AREA(ACRES) =    5.84   SUBAREA RUNOFF(CFS) =   21.09
 TOTAL AREA(ACRES) =    226.51   TOTAL RUNOFF(CFS) =  522.36
 TC(MIN.) =  15.43

****************************************************************************
 FLOW PROCESS FROM NODE   2506.10 TO NODE   2506.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.458
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5115
 SUBAREA AREA(ACRES) =    5.44   SUBAREA RUNOFF(CFS) =    6.55
 TOTAL AREA(ACRES) =    231.95   TOTAL RUNOFF(CFS) =  528.91
 TC(MIN.) =  15.43

****************************************************************************
 FLOW PROCESS FROM NODE   2506.00 TO NODE   2504.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   890.00  DOWNSTREAM(FEET) =   840.00
 FLOW LENGTH(FEET) =   500.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  54.0 INCH PIPE IS  39.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  41.96
 ESTIMATED PIPE DIAMETER(INCH) =  54.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    528.91
 PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =  15.63
 LONGEST FLOWPATH FROM NODE   2526.50 TO NODE   2504.00 =  6000.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2506.00 TO NODE   2504.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.421
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5245
 SUBAREA AREA(ACRES) =   10.93   SUBAREA RUNOFF(CFS) =   38.66
 TOTAL AREA(ACRES) =    242.88   TOTAL RUNOFF(CFS) =  563.23
 TC(MIN.) =  15.63

****************************************************************************
 FLOW PROCESS FROM NODE   2504.00 TO NODE   2504.00 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.) =  15.63
  RAINFALL INTENSITY(INCH/HR) =   4.42
  TOTAL STREAM AREA(ACRES) =   242.88
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    563.23

****************************************************************************
  FLOW PROCESS FROM NODE   2503.30 TO NODE   2503.20 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1180.00
  DOWNSTREAM ELEVATION(FEET) =   1140.00
  ELEVATION DIFFERENCE(FEET) =     40.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.684
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.647
  SUBAREA RUNOFF(CFS) =      0.76
  TOTAL AREA(ACRES) =      0.33   TOTAL RUNOFF(CFS) =      0.76

****************************************************************************
  FLOW PROCESS FROM NODE   2503.20 TO NODE   2503.10 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1140.00  DOWNSTREAM(FEET) =    875.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   560.00   CHANNEL SLOPE =  0.4732
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2223 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.76
  FLOW VELOCITY(FEET/SEC) =   2.64 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.53   Tc(MIN.) =  10.22
  LONGEST FLOWPATH FROM NODE   2503.30 TO NODE   2503.10 =   660.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2503.20 TO NODE   2503.10 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.815
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2903
  SUBAREA AREA(ACRES) =   10.14   SUBAREA RUNOFF(CFS) =   17.10
  TOTAL AREA(ACRES) =     10.47   TOTAL RUNOFF(CFS) =   17.68
  TC(MIN.) =  10.22

****************************************************************************
  FLOW PROCESS FROM NODE   2503.10 TO NODE   2504.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =    875.00  DOWNSTREAM(FEET) =    840.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   310.00   CHANNEL SLOPE =  0.1129
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1097 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     17.68
 FLOW VELOCITY(FEET/SEC) =   4.83 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.07   Tc(MIN.) =  11.29
 LONGEST FLOWPATH FROM NODE   2503.30 TO NODE   2504.00 =   970.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2504.00 TO NODE   2504.00 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.) =  11.29
 RAINFALL INTENSITY(INCH/HR) =   5.45
 TOTAL STREAM AREA(ACRES) =    10.47
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     17.68

****************************************************************************
 FLOW PROCESS FROM NODE   2505.20 TO NODE   2505.10 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1190.00
 DOWNSTREAM ELEVATION(FEET) =   1150.00
 ELEVATION DIFFERENCE(FEET) =     40.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
 SUBAREA RUNOFF(CFS) =      0.55
 TOTAL AREA(ACRES) =      0.30   TOTAL RUNOFF(CFS) =      0.55

****************************************************************************
 FLOW PROCESS FROM NODE   2505.10 TO NODE   2505.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1150.00  DOWNSTREAM(FEET) =    925.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   781.00   CHANNEL SLOPE =  0.2881
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1920 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.55
 FLOW VELOCITY(FEET/SEC) =   2.45 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   5.30   Tc(MIN.) =  12.41
 LONGEST FLOWPATH FROM NODE   2505.20 TO NODE   2505.00 =   881.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2505.10 TO NODE   2505.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.131
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
```

```
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2598
 SUBAREA AREA(ACRES) =   13.57   SUBAREA RUNOFF(CFS) =   18.10
 TOTAL AREA(ACRES) =     13.87   TOTAL RUNOFF(CFS) =   18.49
 TC(MIN.) =  12.41

****************************************************************************
 FLOW PROCESS FROM NODE   2505.00 TO NODE   2504.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  880.00  DOWNSTREAM ELEVATION(FEET) =  860.00
 STREET LENGTH(FEET) =   875.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 16.00

 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(curb-to-curb) =   0.0500
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.97
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.67
   HALFSTREET FLOOD WIDTH(FEET) =   24.33
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.32
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.54
 STREET FLOW TRAVEL TIME(MIN.) =   6.29   Tc(MIN.) =  18.70
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.938
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8100
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.471
 SUBAREA AREA(ACRES) =    8.63      SUBAREA RUNOFF(CFS) =   27.53
 TOTAL AREA(ACRES) =     22.50        PEAK FLOW RATE(CFS) =      41.72

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.72   HALFSTREET FLOOD WIDTH(FEET) =  26.89
 FLOW VELOCITY(FEET/SEC.) =  2.54   DEPTH*VELOCITY(FT*FT/SEC.) =   1.82
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  875.0 FT WITH ELEVATION-DROP =  20.0 FT, IS   64.5 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   2504.00
 LONGEST FLOWPATH FROM NODE   2505.20 TO NODE   2504.00 =  1756.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2504.00 TO NODE   2504.00 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.) =  18.70
 RAINFALL INTENSITY(INCH/HR) =   3.94
 TOTAL STREAM AREA(ACRES) =    22.50
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     41.72

 ** CONFLUENCE DATA **
```

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	563.23	15.63	4.421	242.88
2	17.68	11.29	5.453	10.47
3	41.72	18.70	3.938	22.50

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	499.52	11.29	5.453
2	612.43	15.63	4.421
3	556.18	18.70	3.938

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 612.43 Tc(MIN.) = 15.63
TOTAL AREA(ACRES) = 275.85
LONGEST FLOWPATH FROM NODE 2526.50 TO NODE 2504.00 = 6000.00 FEET.

****
FLOW PROCESS FROM NODE 2504.00 TO NODE 2503.00 IS CODE = 53

>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 840.00 DOWNSTREAM(FEET) = 835.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 300.00 CHANNEL SLOPE = 0.0167
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .0167 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 612.43
FLOW VELOCITY(FEET/SEC) = 6.13 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 0.82 Tc(MIN.) = 16.44
LONGEST FLOWPATH FROM NODE 2526.50 TO NODE 2503.00 = 6300.00 FEET.

****
FLOW PROCESS FROM NODE 2504.00 TO NODE 2503.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.279
*USER SPECIFIED(SUBAREA):
STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .3900
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.5093
SUBAREA AREA(ACRES) = 4.40 SUBAREA RUNOFF(CFS) = 7.34
TOTAL AREA(ACRES) = 280.25 TOTAL RUNOFF(CFS) = 612.43
TC(MIN.) = 16.44
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****
FLOW PROCESS FROM NODE 2503.00 TO NODE 2503.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
==

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	612.43	16.44	4.279	280.25

LONGEST FLOWPATH FROM NODE 2526.50 TO NODE 2503.00 = 6300.00 FEET.

```
 ** MEMORY BANK #  3 CONFLUENCE DATA **
 STREAM      RUNOFF      Tc       INTENSITY      AREA
 NUMBER       (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
     1       202.11     19.81        3.794       165.63
 LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2503.00 =  6816.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF       Tc       INTENSITY
 NUMBER      (CFS)     (MIN.)    (INCH/HOUR)
     1      780.20      16.44         4.279
     2      745.23      19.81         3.794

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    780.20   Tc(MIN.) =   16.44
 TOTAL AREA(ACRES) =    445.88

****************************************************************************
 FLOW PROCESS FROM NODE   2503.00 TO NODE   2503.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2503.00 TO NODE   2503.00 IS CODE =   7
----------------------------------------------------------------------------
 >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
 USER-SPECIFIED VALUES ARE AS FOLLOWS:
 TC(MIN) =  16.44   RAIN INTENSITY(INCH/HOUR) =  4.28
 TOTAL AREA(ACRES) =   445.88   TOTAL RUNOFF(CFS) =    543.53

****************************************************************************
 FLOW PROCESS FROM NODE   2503.00 TO NODE   2502.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   835.00  DOWNSTREAM(FEET) =   825.00
 FLOW LENGTH(FEET) =   165.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  60.0 INCH PIPE IS  44.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  35.02
 ESTIMATED PIPE DIAMETER(INCH) =  60.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    543.53
 PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =  16.52
 LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2502.00 =  6981.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2502.00 TO NODE   2502.00 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.) =  16.52
 RAINFALL INTENSITY(INCH/HR) =   4.27
 TOTAL STREAM AREA(ACRES) =   445.88
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    543.53

****************************************************************************
 FLOW PROCESS FROM NODE   2502.50 TO NODE   2502.40 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
```

```
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1175.00
 DOWNSTREAM ELEVATION(FEET) =   1150.00
 ELEVATION DIFFERENCE(FEET) =     25.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
 SUBAREA RUNOFF(CFS) =      0.39
 TOTAL AREA(ACRES) =      0.21   TOTAL RUNOFF(CFS) =      0.39

****************************************************************************
 FLOW PROCESS FROM NODE   2502.40 TO NODE   2502.30 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1150.00  DOWNSTREAM(FEET) =   1075.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   302.00   CHANNEL SLOPE =  0.2483
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1794 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.39
 FLOW VELOCITY(FEET/SEC) =   2.37 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.12   Tc(MIN.) =   9.22
 LONGEST FLOWPATH FROM NODE   2502.50 TO NODE   2502.30 =   402.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2502.40 TO NODE   2502.30 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.213
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =    2.17   SUBAREA RUNOFF(CFS) =    3.37
 TOTAL AREA(ACRES) =      2.38   TOTAL RUNOFF(CFS) =    3.70
 TC(MIN.) =   9.22

****************************************************************************
 FLOW PROCESS FROM NODE   2502.30 TO NODE   2502.20 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1075.00  DOWNSTREAM(FEET) =    950.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   640.00   CHANNEL SLOPE =  0.1953
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1577 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      3.70
 FLOW VELOCITY(FEET/SEC) =   3.44 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.10   Tc(MIN.) =  12.33
 LONGEST FLOWPATH FROM NODE   2502.50 TO NODE   2502.20 =  1042.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2502.30 TO NODE   2502.20 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.153
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
SUBAREA AREA(ACRES) =   11.59   SUBAREA RUNOFF(CFS) =   14.93
TOTAL AREA(ACRES) =     13.97   TOTAL RUNOFF(CFS) =   18.00
TC(MIN.) =  12.33

****************************************************************************
FLOW PROCESS FROM NODE   2502.20 TO NODE   2502.10 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    950.00  DOWNSTREAM(FEET) =    890.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   430.00   CHANNEL SLOPE =  0.1395
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .1280 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) =     18.00
FLOW VELOCITY(FEET/SEC) =   5.25 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   1.37   Tc(MIN.) =  13.69
LONGEST FLOWPATH FROM NODE   2502.50 TO NODE   2502.10 =  1472.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   2502.20 TO NODE   2502.10 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.815
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
SUBAREA AREA(ACRES) =   14.58   SUBAREA RUNOFF(CFS) =   17.55
TOTAL AREA(ACRES) =     28.55   TOTAL RUNOFF(CFS) =   34.37
TC(MIN.) =  13.69

****************************************************************************
FLOW PROCESS FROM NODE   2502.10 TO NODE   2502.00 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    890.00  DOWNSTREAM(FEET) =    830.00
CHANNEL LENGTH THRU SUBAREA(FEET) =  1040.00   CHANNEL SLOPE =  0.0577
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .0577 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) =     34.37
FLOW VELOCITY(FEET/SEC) =   4.37 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   3.97   Tc(MIN.) =  17.66
LONGEST FLOWPATH FROM NODE   2502.50 TO NODE   2502.00 =  2512.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   2502.00 TO NODE   2502.00 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.) =  17.66
RAINFALL INTENSITY(INCH/HR) =   4.09
TOTAL STREAM AREA(ACRES) =    28.55
```

```
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     34.37

****************************************************************************
 FLOW PROCESS FROM NODE   2502.80 TO NODE   2502.70 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1180.00
 DOWNSTREAM ELEVATION(FEET) =   1175.00
 ELEVATION DIFFERENCE(FEET) =      5.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.422
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.588
 SUBAREA RUNOFF(CFS) =      0.38
 TOTAL AREA(ACRES) =      0.19   TOTAL RUNOFF(CFS) =      0.38

****************************************************************************
 FLOW PROCESS FROM NODE   2502.70 TO NODE   2502.60 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1175.00  DOWNSTREAM(FEET) =    875.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   665.00   CHANNEL SLOPE =  0.4511
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2201 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.38
 FLOW VELOCITY(FEET/SEC) =   2.63 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   4.22   Tc(MIN.) =  12.64
 LONGEST FLOWPATH FROM NODE   2502.80 TO NODE   2502.60 =   765.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2502.70 TO NODE   2502.60 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.070
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3000
 SUBAREA AREA(ACRES) =     7.00   SUBAREA RUNOFF(CFS) =   10.65
 TOTAL AREA(ACRES) =      7.19   TOTAL RUNOFF(CFS) =   10.94
 TC(MIN.) =  12.64

****************************************************************************
 FLOW PROCESS FROM NODE   2502.60 TO NODE   2502.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  875.00  DOWNSTREAM ELEVATION(FEET) =  830.00
 STREET LENGTH(FEET) =   815.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 16.00

 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(curb-to-curb) =   0.0500
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.68
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.48
   HALFSTREET FLOOD WIDTH(FEET) =   16.00
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.33
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.11
 STREET FLOW TRAVEL TIME(MIN.) =   5.84   Tc(MIN.) =  18.48
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.968
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8100
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.426
 SUBAREA AREA(ACRES) =    2.36      SUBAREA RUNOFF(CFS) =    7.59
 TOTAL AREA(ACRES) =      9.55        PEAK FLOW RATE(CFS) =      16.15

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.49   HALFSTREET FLOOD WIDTH(FEET) =  16.00
 FLOW VELOCITY(FEET/SEC.) =  2.41   DEPTH*VELOCITY(FT*FT/SEC.) =   1.18
 LONGEST FLOWPATH FROM NODE   2502.80 TO NODE   2502.00 =  1580.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2502.00 TO NODE   2502.00 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.) =  18.48
 RAINFALL INTENSITY(INCH/HR) =   3.97
 TOTAL STREAM AREA(ACRES) =     9.55
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.15

 ** CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY      AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1      543.53    16.52        4.266        445.88
     2       34.37    17.66        4.086         28.55
     3       16.15    18.48        3.968          9.55

 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      590.10    16.52       4.266
     2      570.35    17.66       4.086
     3      555.09    18.48       3.968

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    590.10   Tc(MIN.) =   16.52
 TOTAL AREA(ACRES) =    483.98
 LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2502.00 =  6981.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2502.00 TO NODE   2501.00 IS CODE =  53
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    830.00  DOWNSTREAM(FEET) =    825.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   800.00   CHANNEL SLOPE =  0.0063
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0063 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    590.10
  FLOW VELOCITY(FEET/SEC) =   3.71 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.60   Tc(MIN.) =  20.12
  LONGEST FLOWPATH FROM NODE   2575.20 TO NODE   2501.00 =  7781.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2502.00 TO NODE   2501.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.757
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2853
  SUBAREA AREA(ACRES) =   26.06   SUBAREA RUNOFF(CFS) =   27.41
  TOTAL AREA(ACRES) =    510.04   TOTAL RUNOFF(CFS) =  590.10
  TC(MIN.) =  20.12
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE   2501.00 TO NODE     25.01 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    825.00  DOWNSTREAM(FEET) =    822.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   490.00   CHANNEL SLOPE =  0.0061
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0061 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    590.10
  FLOW VELOCITY(FEET/SEC) =   3.67 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.23   Tc(MIN.) =  22.34
  LONGEST FLOWPATH FROM NODE   2575.20 TO NODE     25.01 =  8271.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     25.01 TO NODE     25.01 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.) =  22.34
  RAINFALL INTENSITY(INCH/HR) =   3.51
  TOTAL STREAM AREA(ACRES) =   510.04
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    590.10

****************************************************************************
  FLOW PROCESS FROM NODE     25.10 TO NODE     25.09 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1180.00
 DOWNSTREAM ELEVATION(FEET) =   1160.00
 ELEVATION DIFFERENCE(FEET) =     20.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.684
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.647
 SUBAREA RUNOFF(CFS) =      0.32
 TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.32

****************************************************************************
 FLOW PROCESS FROM NODE     25.09 TO NODE     25.08 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1160.00  DOWNSTREAM(FEET) =   1055.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   475.00   CHANNEL SLOPE =  0.2211
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1704 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.32
 FLOW VELOCITY(FEET/SEC) =   2.31 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.43   Tc(MIN.) =  10.11
 LONGEST FLOWPATH FROM NODE     25.10 TO NODE     25.08 =   575.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     25.09 TO NODE     25.08 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.856
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3000
 SUBAREA AREA(ACRES) =    6.15   SUBAREA RUNOFF(CFS) =   10.80
 TOTAL AREA(ACRES) =      6.29   TOTAL RUNOFF(CFS) =   11.05
 TC(MIN.) =  10.11

****************************************************************************
 FLOW PROCESS FROM NODE     25.08 TO NODE     25.07 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1055.00  DOWNSTREAM(FEET) =    865.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   675.00   CHANNEL SLOPE =  0.2815
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1904 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     11.05
 FLOW VELOCITY(FEET/SEC) =   5.44 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.07   Tc(MIN.) =  12.18
 LONGEST FLOWPATH FROM NODE     25.10 TO NODE     25.07 =  1250.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     25.08 TO NODE     25.07 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.193
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3000
  SUBAREA AREA(ACRES) =    10.64   SUBAREA RUNOFF(CFS) =   16.58
  TOTAL AREA(ACRES) =      16.93   TOTAL RUNOFF(CFS) =   26.38
  TC(MIN.) =  12.18

****************************************************************************
  FLOW PROCESS FROM NODE      25.07 TO NODE      25.06 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     865.00  DOWNSTREAM(FEET) =     850.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   540.00   CHANNEL SLOPE =  0.0278
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0278 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      26.38
  FLOW VELOCITY(FEET/SEC) =   2.78 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.24   Tc(MIN.) =  15.42
  LONGEST FLOWPATH FROM NODE      25.10 TO NODE      25.06 =  1790.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      25.07 TO NODE      25.06 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.460
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (24. DU/AC OR LESS) RUNOFF COEFFICIENT = .8100
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4385
  SUBAREA AREA(ACRES) =     6.31   SUBAREA RUNOFF(CFS) =   22.79
  TOTAL AREA(ACRES) =      23.24   TOTAL RUNOFF(CFS) =   45.44
  TC(MIN.) =  15.42

****************************************************************************
  FLOW PROCESS FROM NODE      25.06 TO NODE      25.01 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     850.00  DOWNSTREAM(FEET) =     822.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   380.00   CHANNEL SLOPE =  0.0737
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0737 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      45.44
  FLOW VELOCITY(FEET/SEC) =   5.42 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.17   Tc(MIN.) =  16.59
  LONGEST FLOWPATH FROM NODE      25.10 TO NODE      25.01 =  2170.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      25.01 TO NODE      25.01 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.) =  16.59
  RAINFALL INTENSITY(INCH/HR) =   4.25
  TOTAL STREAM AREA(ACRES) =    23.24
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     45.44

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

```
 FLOW PROCESS FROM NODE     25.05 TO NODE     25.04 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3300
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1300.00
 DOWNSTREAM ELEVATION(FEET) =   1275.00
 ELEVATION DIFFERENCE(FEET) =     25.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.434
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.838
 SUBAREA RUNOFF(CFS) =      0.23
 TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.23

****************************************************************************
 FLOW PROCESS FROM NODE     25.04 TO NODE     25.03 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1275.00  DOWNSTREAM(FEET) =   1050.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   575.00   CHANNEL SLOPE =  0.3913
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2125 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.23
 FLOW VELOCITY(FEET/SEC) =   2.58 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.71   Tc(MIN.) =  10.15
 LONGEST FLOWPATH FROM NODE     25.05 TO NODE     25.03 =   675.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     25.04 TO NODE     25.03 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.842
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3005
 SUBAREA AREA(ACRES) =     5.10   SUBAREA RUNOFF(CFS) =     8.94
 TOTAL AREA(ACRES) =      5.19   TOTAL RUNOFF(CFS) =    9.11
 TC(MIN.) =  10.15

****************************************************************************
 FLOW PROCESS FROM NODE     25.03 TO NODE     25.02 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1050.00  DOWNSTREAM(FEET) =    845.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   895.00   CHANNEL SLOPE =  0.2291
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1730 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      9.11
 FLOW VELOCITY(FEET/SEC) =   4.86 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.07   Tc(MIN.) =  13.21
 LONGEST FLOWPATH FROM NODE     25.05 TO NODE     25.02 =  1570.00 FEET.

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

```
 FLOW PROCESS FROM NODE     25.03 TO NODE     25.02 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.927
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3002
 SUBAREA AREA(ACRES) =    9.66   SUBAREA RUNOFF(CFS) =   14.28
 TOTAL AREA(ACRES) =     14.85   TOTAL RUNOFF(CFS) =   21.96
 TC(MIN.) =  13.21

****************************************************************************
 FLOW PROCESS FROM NODE     25.02 TO NODE     25.01 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   845.00  DOWNSTREAM(FEET) =   822.00
 FLOW LENGTH(FEET) =   510.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  14.31
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     21.96
 PIPE TRAVEL TIME(MIN.) =   0.59    Tc(MIN.) =  13.81
 LONGEST FLOWPATH FROM NODE     25.05 TO NODE     25.01 =  2080.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     25.01 TO NODE     25.01 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.) =  13.81
 RAINFALL INTENSITY(INCH/HR) =   4.79
 TOTAL STREAM AREA(ACRES) =    14.85
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     21.96

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY      AREA
 NUMBER       (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
     1       590.10    22.34        3.511         510.04
     2        45.44    16.59        4.254          23.24
     3        21.96    13.81        4.789          14.85

 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       492.42    13.81        4.789
     2       551.96    16.59        4.254
     3       643.71    22.34        3.511

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    643.71   Tc(MIN.) =   22.34
 TOTAL AREA(ACRES) =    548.13
 LONGEST FLOWPATH FROM NODE   2575.20 TO NODE     25.01 =  8271.00 FEET.
```

```
**************************************************************************
 FLOW PROCESS FROM NODE     25.01 TO NODE     25.00 IS CODE =  81
--------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.511
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2923
 SUBAREA AREA(ACRES) =    8.91   SUBAREA RUNOFF(CFS) =    9.39
 TOTAL AREA(ACRES) =    557.04   TOTAL RUNOFF(CFS) =  643.71
 TC(MIN.) =  22.34
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

**************************************************************************
 FLOW PROCESS FROM NODE     25.01 TO NODE     25.00 IS CODE =  31
--------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   822.00  DOWNSTREAM(FEET) =   798.00
 FLOW LENGTH(FEET) =   375.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  63.0 INCH PIPE IS  46.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  37.24
 ESTIMATED PIPE DIAMETER(INCH) =  63.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    643.71
 PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =  22.51
 LONGEST FLOWPATH FROM NODE   2575.20 TO NODE     25.00 =  8646.00 FEET.
==========================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =    557.04  TC(MIN.) =     22.51
 PEAK FLOW RATE(CFS)   =    643.71
==========================================================================
==========================================================================
 END OF RATIONAL METHOD ANALYSIS
```

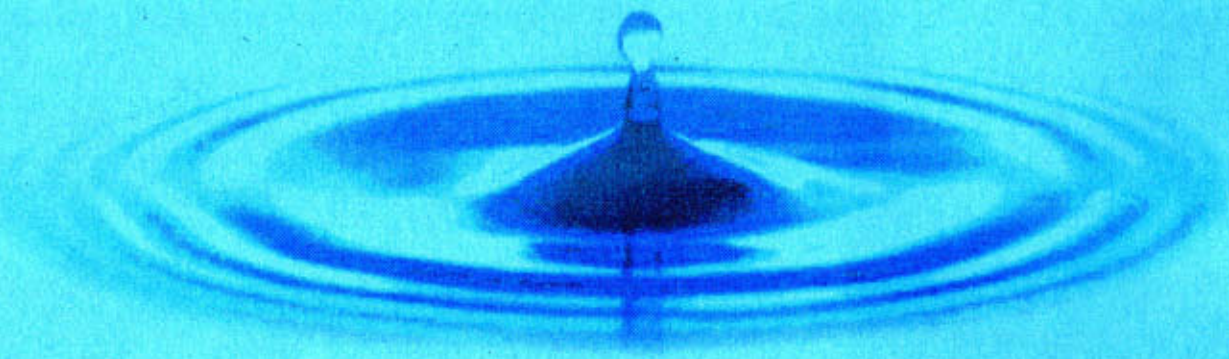
APPENDIX A

AES - 2005

Rational Method Hydrology

Proposed Condition

BASIN C



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Job Name:
Merriam Mountains - Proposed Hydrology

Job #:
2469.01A

Date:
October 2006

Run Name:
MER26-PD

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Land Use	Runoff Coeff.	Area (ac.)	Comments
2637	2636	2	1,439.2	1,439.0	100.0	7	0.79	0.45	
2636	2635	6	1,439.0	1,432.0	615.0	7	0.79	5.94	
2635.1	2635	8				7	0.79	1.72	
2635	2634	3	1,425.0	1,390.0	410.0				
2635	2634	8				7	0.79	1.82	
2634	2630	3	1,390.0	1,335.0	625.0				
2634	2630	8				7	0.79	5.14	
2630	2630	1							1 of 2
2633	2632	2	1,605.0	1,580.0	100.0	21	0.35	0.24	
2632	2631	5	1,580.0	1,425.0	545.0				
2632	2631	8				21	0.35	5.48	
2631	2630	3	1,425.0	1,335.0	250.0				
2630	2630	1							2 of 2
2630	2620	3	1,335.0	1,330.0	225.0				
2620	2620	10							Bank # 1
2627	2626	2	1,423.2	1,423.0	100.0	7	0.79	0.22	
2626	2621	6	1,423.0	1,385.0	370.0	7	0.79	2.42	
2621	2621	1							1 of 2
2624	2623	2	1,450.0	1,440.0	100.0	21	0.30	1.12	
2624	2623	5	1,440.0	1,400.0	250.0				
2624	2623	8				21	0.30	2.78	
2623	2622	3	1,400.0	1,390.0	220.0				
2622	2621	3	1,390.0	1,380.0	265.0				
2625	2621	8				7	0.78	4.42	
2621	2621	1							2 of 2
2621	2620	3	1,380.0	1,350.0	440.0				
2620.1	2620	8				7	0.78	7.9	
2620	2620	11							ADD Bank #1
2620	2620	12							Delete Bank #1
2620	2612	3	1,350.0	1,306.0	560.0				
2612	2612	1							1 of 2
2619	2618	2	1,412.5	1,412.3	95.0	7	0.77	0.13	
2618	2617	6	1,412.3	1,395.0	615.0	7	0.77	3.45	
2617	2616	3	1,390.0	1,375.0	400.0				
2617	2616	8				7	0.77	1.26	
2616	2615	3	1,373.0	1,350.0	390.0				
2616	2615	8				7	0.77	2.51	
2615	2613	3	1,350.0	1,315.0	665.0				
2613.1	2613	8				7	0.77	3.68	
2614	2613	8				7	0.77	1.95	
2615	2613	8				7	0.79	4.22	
2613	2612	3	1,315.0	1,306.0	255.0				
2612	2612	1							2 of 2
2612	2611	3	1,306.0	1,268.0	615.0				
2612	2611	8				7	0.78	8.27	

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Job Name:
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Job #:
2469.01A

Date:
October 2006

Run Name:
MER26-PD

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Land Use	Runoff Coeff.	Area (ac.)	Comments
2611	2610	3	1,268.0	1,250.0	450.0				
2611	2610	8				7	0.77	2.72	
2610	2610	1							1 of 2
2610.2	2610.1	2	1,375.0	1,350.0	100.0	21	0.25	0.27	
2610.1	2610	5	1,350.0	1,245.0	520.0				
2610.1	2610	8				21	0.25	2.45	
2610	2610	1							2 of 2
2610	2607.6	3	1,250.0	1,231.0	275.0				
2610	2607.6	8				7	0.77	1.85	
2607.6	2607.5	3	1,231.0	1,225.0	315.0				
2607.6	2607.5	8				7	0.77	2.08	
2607.5	2607.4	3	1,225.0	1,215.0	235.0				
2607.5	2607.4	8				7	0.77	2.24	
2607.4	2607	3	1,215.0	1,201.0	175.0				
2607	2607	1							1 of 2
2607.3	2607.2	2	1,390.0	1,350.0	100.0	21	0.25	0.42	
2607.2	2607.1	5	1,350.0	1,210.0	440.0				
2607.2	2607.1	8				21	0.25	5.09	
2607.1	2607	3	1,204.0	1,201.0	380.0				
2607	2607	1							2 of 2
2607	2606	3	1,201.0	1,188.0	200.0				
2606.1	2606	8				7	0.77	3.22	
2606	2604	3	1,188.0	1,187.0	115.0				
2604	2604	10							Bank #1
2609.3	2609.2	2	1,380.0	1,340.0	100.0	21	0.31	0.14	
2609.2	2609	5	1,340.0	1,250.0	250.0				
2609.2	2609	8				21	0.26	1.28	
2609.1	2609	8				7	0.77	1.46	
2609	2608	3	1,240.0	1,238.0	180.0				
2608	2608	1							1 of 2
2608.3	2608.2	2	1,340.0	1,336.0	100.0	7	0.79	0.34	
2608.2	2608.1	6	1,336.0	1,280.0	545.0	7	0.79	1.18	
2608.4	2608.1	8				21	0.35	4.4	
2608.1	2608	3	1,274.0	1,238.0	255.0				
2608	2608	1							2 of 2
2608	2605.5	3	1,238.0	1,234.0	640.0				
2608	2605.5	8				7	0.77	6.01	
2605.5	2605.4	3	1,234.0	1,232.0	350.0				
2605.5	2605.4	8				7	0.77	5.82	
2605.4	2605.3	3	1,232.0	1,228.0	700.0				
2605.4	2605.3	8				7	0.77	9.74	
2605.3	2605.2	3	1,228.0	1,223.0	355.0				
2605.3	2605.2	8				7	0.77	2.2	
2605.2	2605.1	3	1,223.0	1,205.0	340.0				

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Job Name:
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Job #:
2469.01A

Date:
October 2006

Run Name:
MER26-PD

		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Land Use	Runoff Coeff.	Area (ac.)	Comments
2605.2	2605.1	8				7	0.77	1.95	
2605.1	2605	3	1,205.0	1,193.0	305.0				
2605.1	2605	8				7	0.77	2.28	
2605	2604	3	1,193.0	1,187.0	380.0				
2604	2604	1							1 of 2
2604.3	2604.2	2	1,237.0	1,235.0	100.0	7	0.77	0.19	
2604.2	2604.1	6	1,235.0	1,217.0	485.0	7	0.77	2.43	
2604.1	2604	3	1,211.0	1,187.0	400.0				
2604	2604	1							2 of 2
2604.1	2604	8				7	0.77	6.43	
2604	2604	11							Add Bank #1
2604	2602	3	1,187.0	1,145.0	140.0				
2602	2601	5	1,145.0	1,140.0	250.0				
2602	2601	8				21	0.49	4.46	
2603	2601	8				21	0.25	10.59	Pre-Detention Area
2601	2601	7							DET OUT Q = 137.90 CFS
2601	26	5	1,140.0	975.0	1,430.0				Post-Detention Flow
2601	26	8				21	0.25	32.01	
								178.37	Total Area

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

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                       2003,1985,1981 HYDROLOGY MANUAL
        (c) Copyright 1982-2004 Advanced Engineering Software (aes)
            Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                          Analysis prepared by:

                    FUSCOE ENGINEERING - SAN DIEGO, INC.
                      6390 GREENWICH DRIVE, SUITE 170
                        SAN DIEGO, CALIFORNIA 92122
                             (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 26 - WITH DETENTION STORAGE ROUTING                          *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MER26-PD.DAT
  TIME/DATE OF STUDY: 15:58 10/02/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   2637.00 TO NODE   2636.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1439.20
  DOWNSTREAM ELEVATION(FEET) =   1439.00
  ELEVATION DIFFERENCE(FEET) =      0.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.971
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
```

```
          THE MAXIMUM OVERLAND FLOW LENGTH =    50.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) =      3.28
TOTAL AREA(ACRES) =      0.45   TOTAL RUNOFF(CFS) =      3.28

****************************************************************************
 FLOW PROCESS FROM NODE   2636.00 TO NODE   2635.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1439.00  DOWNSTREAM ELEVATION(FEET) = 1432.00
 STREET LENGTH(FEET) =   615.00   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) =   0.0130
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.76
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.45
   HALFSTREET FLOOD WIDTH(FEET) =   16.14
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.63
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.63
 STREET FLOW TRAVEL TIME(MIN.) =   2.82   Tc(MIN.) =   7.79
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.925
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.790
 SUBAREA AREA(ACRES) =     5.94      SUBAREA RUNOFF(CFS) =   32.50
 TOTAL AREA(ACRES) =      6.39        PEAK FLOW RATE(CFS) =      34.96

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.52   HALFSTREET FLOOD WIDTH(FEET) =  19.05
 FLOW VELOCITY(FEET/SEC.) =  4.37   DEPTH*VELOCITY(FT*FT/SEC.) =   2.28
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  615.0 FT WITH ELEVATION-DROP =   7.0 FT, IS   43.3 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   2635.00
 LONGEST FLOWPATH FROM NODE   2637.00 TO NODE   2635.00 =   715.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2635.10 TO NODE   2635.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.925
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7900
 SUBAREA AREA(ACRES) =     1.72   SUBAREA RUNOFF(CFS) =    9.41
 TOTAL AREA(ACRES) =      8.11   TOTAL RUNOFF(CFS) =   44.37
 TC(MIN.) =   7.79
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2635.00 TO NODE   2634.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1425.00  DOWNSTREAM(FEET) =  1390.00
  FLOW LENGTH(FEET) =   410.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  14.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.64
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     44.37
  PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =   8.11
  LONGEST FLOWPATH FROM NODE   2637.00 TO NODE   2634.00 =  1125.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2635.00 TO NODE   2634.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.750
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7900
  SUBAREA AREA(ACRES) =     1.82   SUBAREA RUNOFF(CFS) =    9.71
  TOTAL AREA(ACRES) =       9.93   TOTAL RUNOFF(CFS) =   52.95
  TC(MIN.) =   8.11

****************************************************************************
  FLOW PROCESS FROM NODE   2634.00 TO NODE   2630.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1390.00  DOWNSTREAM(FEET) =  1335.00
  FLOW LENGTH(FEET) =   625.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.67
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     52.95
  PIPE TRAVEL TIME(MIN.) =   0.46    Tc(MIN.) =   8.57
  LONGEST FLOWPATH FROM NODE   2637.00 TO NODE   2630.00 =  1750.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2634.00 TO NODE   2630.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.514
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7900
  SUBAREA AREA(ACRES) =     5.14   SUBAREA RUNOFF(CFS) =   26.45
  TOTAL AREA(ACRES) =      15.07   TOTAL RUNOFF(CFS) =   77.56
  TC(MIN.) =   8.57

****************************************************************************
  FLOW PROCESS FROM NODE   2630.00 TO NODE   2630.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```

```
==========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   8.57
  RAINFALL INTENSITY(INCH/HR) =   6.51
  TOTAL STREAM AREA(ACRES) =    15.07
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     77.56

****************************************************************************
  FLOW PROCESS FROM NODE   2633.00 TO NODE   2632.00 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) =   1605.00
  DOWNSTREAM ELEVATION(FEET) =   1580.00
  ELEVATION DIFFERENCE(FEET) =     25.00
  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) =  7.972
  SUBAREA RUNOFF(CFS) =      0.67
  TOTAL AREA(ACRES) =      0.24   TOTAL RUNOFF(CFS) =      0.67

****************************************************************************
  FLOW PROCESS FROM NODE   2632.00 TO NODE   2631.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1580.00  DOWNSTREAM(FEET) =   1425.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   545.00   CHANNEL SLOPE =  0.2844
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1911 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.67
  FLOW VELOCITY(FEET/SEC) =   2.45 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.71   Tc(MIN.) =   9.98
  LONGEST FLOWPATH FROM NODE   2633.00 TO NODE   2631.00 =   645.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2632.00 TO NODE   2631.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.906
  *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) =     5.48   SUBAREA RUNOFF(CFS) =   11.33
  TOTAL AREA(ACRES) =      5.72   TOTAL RUNOFF(CFS) =   11.82
  TC(MIN.) =   9.98

****************************************************************************
  FLOW PROCESS FROM NODE   2631.00 TO NODE   2630.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1425.00  DOWNSTREAM(FEET) =  1335.00
```

```
 FLOW LENGTH(FEET) =   250.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  26.33
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     11.82
 PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =  10.14
 LONGEST FLOWPATH FROM NODE   2633.00 TO NODE   2630.00 =   895.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2630.00 TO NODE   2630.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  10.14
 RAINFALL INTENSITY(INCH/HR) =   5.85
 TOTAL STREAM AREA(ACRES) =     5.72
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.82

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY      AREA
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
     1        77.56      8.57         6.514         15.07
     2        11.82     10.14         5.846          5.72

 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        87.55      8.57         6.514
     2        81.42     10.14         5.846

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     87.55   Tc(MIN.) =    8.57
 TOTAL AREA(ACRES) =     20.79
 LONGEST FLOWPATH FROM NODE   2637.00 TO NODE   2630.00 =  1750.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2630.00 TO NODE   2620.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1335.00  DOWNSTREAM(FEET) =  1330.00
 FLOW LENGTH(FEET) =   225.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  36.0 INCH PIPE IS  27.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  15.15
 ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     87.55
 PIPE TRAVEL TIME(MIN.) =   0.25    Tc(MIN.) =   8.82
 LONGEST FLOWPATH FROM NODE   2637.00 TO NODE   2620.00 =  1975.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2620.00 TO NODE   2620.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================
```

```
**************************************************************************
 FLOW PROCESS FROM NODE   2627.00 TO NODE   2626.00 IS CODE =  21
--------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1423.20
 DOWNSTREAM ELEVATION(FEET) =   1423.00
 ELEVATION DIFFERENCE(FEET) =      0.20
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.971
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    50.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      1.60
 TOTAL AREA(ACRES) =      0.22   TOTAL RUNOFF(CFS) =      1.60

**************************************************************************
 FLOW PROCESS FROM NODE   2626.00 TO NODE   2621.00 IS CODE =  61
--------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
==========================================================================
 UPSTREAM ELEVATION(FEET) = 1423.00  DOWNSTREAM ELEVATION(FEET) = 1385.00
 STREET LENGTH(FEET) =   370.00   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) =   0.0130
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.59
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.28
   HALFSTREET FLOOD WIDTH(FEET) =    7.45
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.13
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.96
 STREET FLOW TRAVEL TIME(MIN.) =   0.86   Tc(MIN.) =   5.84
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.346
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.790
 SUBAREA AREA(ACRES) =     2.42      SUBAREA RUNOFF(CFS) =   15.96
 TOTAL AREA(ACRES) =      2.64        PEAK FLOW RATE(CFS) =      17.41

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.32   HALFSTREET FLOOD WIDTH(FEET) =   9.74
 FLOW VELOCITY(FEET/SEC.) =  8.16   DEPTH*VELOCITY(FT*FT/SEC.) =   2.62
 LONGEST FLOWPATH FROM NODE   2627.00 TO NODE   2621.00 =   470.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE   2621.00 TO NODE   2621.00 IS CODE =   1
```

```
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.84
  RAINFALL INTENSITY(INCH/HR) =    8.35
  TOTAL STREAM AREA(ACRES) =      2.64
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      17.41

****************************************************************************
  FLOW PROCESS FROM NODE    2624.00 TO NODE    2623.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    100.00
  UPSTREAM ELEVATION(FEET) =    1450.00
  DOWNSTREAM ELEVATION(FEET) =    1440.00
  ELEVATION DIFFERENCE(FEET) =      10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =     6.684
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.647
  SUBAREA RUNOFF(CFS) =       2.57
  TOTAL AREA(ACRES) =       1.12   TOTAL RUNOFF(CFS) =       2.57

****************************************************************************
  FLOW PROCESS FROM NODE    2624.00 TO NODE    2623.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    1440.00  DOWNSTREAM(FEET) =    1400.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    250.00   CHANNEL SLOPE =  0.1600
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1400 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =       2.57
  FLOW VELOCITY(FEET/SEC) =    2.87 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =    1.45   Tc(MIN.) =    8.14
  LONGEST FLOWPATH FROM NODE    2624.00 TO NODE    2623.00 =    350.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    2624.00 TO NODE    2623.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.736
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3000
  SUBAREA AREA(ACRES) =     2.78   SUBAREA RUNOFF(CFS) =     5.62
  TOTAL AREA(ACRES) =       3.90   TOTAL RUNOFF(CFS) =    7.88
  TC(MIN.) =   8.14

****************************************************************************
  FLOW PROCESS FROM NODE    2623.00 TO NODE    2622.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =  1400.00  DOWNSTREAM(FEET) =  1390.00
 FLOW LENGTH(FEET) =   220.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  11.13
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      7.88
 PIPE TRAVEL TIME(MIN.) =   0.33    Tc(MIN.) =   8.47
 LONGEST FLOWPATH FROM NODE   2624.00 TO NODE   2622.00 =   570.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2622.00 TO NODE   2621.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1390.00  DOWNSTREAM(FEET) =  1380.00
 FLOW LENGTH(FEET) =   265.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.39
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      7.88
 PIPE TRAVEL TIME(MIN.) =   0.42    Tc(MIN.) =   8.89
 LONGEST FLOWPATH FROM NODE   2624.00 TO NODE   2621.00 =   835.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2625.00 TO NODE   2621.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.362
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7800
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5550
 SUBAREA AREA(ACRES) =     4.42   SUBAREA RUNOFF(CFS) =   21.93
 TOTAL AREA(ACRES) =       8.32   TOTAL RUNOFF(CFS) =   29.38
 TC(MIN.) =   8.89

****************************************************************************
 FLOW PROCESS FROM NODE   2621.00 TO NODE   2621.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   8.89
 RAINFALL INTENSITY(INCH/HR) =   6.36
 TOTAL STREAM AREA(ACRES) =     8.32
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     29.38

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY      AREA
 NUMBER       (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        17.41      5.84        8.346          2.64
     2        29.38      8.89        6.362          8.32

 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        36.69      5.84        8.346
    2        42.64      8.89        6.362

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     42.64   Tc(MIN.) =    8.89
 TOTAL AREA(ACRES) =     10.96
 LONGEST FLOWPATH FROM NODE   2624.00 TO NODE   2621.00 =   835.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2621.00 TO NODE   2620.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1380.00  DOWNSTREAM(FEET) =  1350.00
 FLOW LENGTH(FEET) =   440.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  19.63
 ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     42.64
 PIPE TRAVEL TIME(MIN.) =   0.37    Tc(MIN.) =   9.26
 LONGEST FLOWPATH FROM NODE   2624.00 TO NODE   2620.00 =  1275.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2620.10 TO NODE   2620.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.195
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7800
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.6821
 SUBAREA AREA(ACRES) =    7.90   SUBAREA RUNOFF(CFS) =   38.17
 TOTAL AREA(ACRES) =     18.86   TOTAL RUNOFF(CFS) =   79.70
 TC(MIN.) =   9.26

****************************************************************************
 FLOW PROCESS FROM NODE   2620.00 TO NODE   2620.00 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        79.70      9.26        6.195       18.86
 LONGEST FLOWPATH FROM NODE   2624.00 TO NODE   2620.00 =  1275.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc       INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)    (INCH/HOUR)   (ACRE)
    1        87.55      8.82        6.396       20.79
 LONGEST FLOWPATH FROM NODE   2637.00 TO NODE   2620.00 =  1975.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc       INTENSITY
 NUMBER     (CFS)     (MIN.)    (INCH/HOUR)
    1      163.40       8.82        6.396
    2      164.50       9.26        6.195
```

```
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    164.50   Tc(MIN.) =    9.26
 TOTAL AREA(ACRES) =     39.65

****************************************************************************
 FLOW PROCESS FROM NODE   2620.00 TO NODE   2620.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2620.00 TO NODE   2612.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1350.00  DOWNSTREAM(FEET) =  1306.00
 FLOW LENGTH(FEET) =   560.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  36.0 INCH PIPE IS  27.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  28.49
 ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    164.50
 PIPE TRAVEL TIME(MIN.) =   0.33    Tc(MIN.) =   9.59
 LONGEST FLOWPATH FROM NODE   2637.00 TO NODE   2612.00 =  2535.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2612.00 TO NODE   2612.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   9.59
 RAINFALL INTENSITY(INCH/HR) =   6.06
 TOTAL STREAM AREA(ACRES) =    39.65
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    164.50

****************************************************************************
 FLOW PROCESS FROM NODE   2619.00 TO NODE   2618.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
 UPSTREAM ELEVATION(FEET) =   1412.50
 DOWNSTREAM ELEVATION(FEET) =   1412.30
 ELEVATION DIFFERENCE(FEET) =      0.20
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.292
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    50.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.890
 SUBAREA RUNOFF(CFS) =      0.89
 TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.89

****************************************************************************
 FLOW PROCESS FROM NODE   2618.00 TO NODE   2617.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
```

```
==============================================================================
  UPSTREAM ELEVATION(FEET) = 1412.30  DOWNSTREAM ELEVATION(FEET) = 1395.00
  STREET LENGTH(FEET) =   615.00   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) =   0.0130
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.31
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.33
    HALFSTREET FLOOD WIDTH(FEET) =   10.23
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.43
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.46
  STREET FLOW TRAVEL TIME(MIN.) =   2.32   Tc(MIN.) =   7.61
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.034
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.770
  SUBAREA AREA(ACRES) =     3.45      SUBAREA RUNOFF(CFS) =   18.69
  TOTAL AREA(ACRES) =       3.58        PEAK FLOW RATE(CFS) =      19.39

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.39   HALFSTREET FLOOD WIDTH(FEET) =  13.32
  FLOW VELOCITY(FEET/SEC.) =  5.12   DEPTH*VELOCITY(FT*FT/SEC.) =   2.01
  LONGEST FLOWPATH FROM NODE   2619.00 TO NODE   2617.00 =   710.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2617.00 TO NODE   2616.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1390.00  DOWNSTREAM(FEET) =  1373.00
  FLOW LENGTH(FEET) =   400.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.22
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     19.39
  PIPE TRAVEL TIME(MIN.) =   0.50    Tc(MIN.) =   8.11
  LONGEST FLOWPATH FROM NODE   2619.00 TO NODE   2616.00 =  1110.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2617.00 TO NODE   2616.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.749
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7700
  SUBAREA AREA(ACRES) =     1.26   SUBAREA RUNOFF(CFS) =    6.55
  TOTAL AREA(ACRES) =       4.84   TOTAL RUNOFF(CFS) =   25.15
  TC(MIN.) =   8.11
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2616.00 TO NODE   2615.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1373.00  DOWNSTREAM(FEET) =  1350.00
  FLOW LENGTH(FEET) =   390.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.36
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     25.15
  PIPE TRAVEL TIME(MIN.) =   0.40    Tc(MIN.) =   8.51
  LONGEST FLOWPATH FROM NODE   2619.00 TO NODE   2615.00 =  1500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2616.00 TO NODE   2615.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.544
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7700
  SUBAREA AREA(ACRES) =     2.51   SUBAREA RUNOFF(CFS) =   12.65
  TOTAL AREA(ACRES) =       7.35   TOTAL RUNOFF(CFS) =   37.04
  TC(MIN.) =   8.51

****************************************************************************
  FLOW PROCESS FROM NODE   2615.00 TO NODE   2613.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1350.00  DOWNSTREAM(FEET) =  1315.00
  FLOW LENGTH(FEET) =   665.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.21
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     37.04
  PIPE TRAVEL TIME(MIN.) =   0.64    Tc(MIN.) =   9.15
  LONGEST FLOWPATH FROM NODE   2619.00 TO NODE   2613.00 =  2165.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2613.10 TO NODE   2613.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.243
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7700
  SUBAREA AREA(ACRES) =     3.68   SUBAREA RUNOFF(CFS) =   17.69
  TOTAL AREA(ACRES) =      11.03   TOTAL RUNOFF(CFS) =   53.03
  TC(MIN.) =   9.15

****************************************************************************
  FLOW PROCESS FROM NODE   2614.00 TO NODE   2613.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.243
*USER SPECIFIED(SUBAREA):
RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.7700
SUBAREA AREA(ACRES) =    1.95   SUBAREA RUNOFF(CFS) =    9.37
TOTAL AREA(ACRES) =     12.98   TOTAL RUNOFF(CFS) =   62.40
TC(MIN.) =   9.15

****************************************************************************
FLOW PROCESS FROM NODE   2615.00 TO NODE   2613.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.243
*USER SPECIFIED(SUBAREA):
RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.7749
SUBAREA AREA(ACRES) =    4.22   SUBAREA RUNOFF(CFS) =   20.81
TOTAL AREA(ACRES) =     17.20   TOTAL RUNOFF(CFS) =   83.21
TC(MIN.) =   9.15

****************************************************************************
FLOW PROCESS FROM NODE   2613.00 TO NODE   2612.00 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =  1315.00  DOWNSTREAM(FEET) =  1306.00
FLOW LENGTH(FEET) =   255.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  33.0 INCH PIPE IS  24.1 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =  17.91
ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =     83.21
PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =   9.39
LONGEST FLOWPATH FROM NODE   2619.00 TO NODE   2612.00 =  2420.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   2612.00 TO NODE   2612.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
TIME OF CONCENTRATION(MIN.) =   9.39
RAINFALL INTENSITY(INCH/HR) =   6.14
TOTAL STREAM AREA(ACRES) =    17.20
PEAK FLOW RATE(CFS) AT CONFLUENCE =     83.21

** CONFLUENCE DATA **
STREAM     RUNOFF      Tc       INTENSITY      AREA
NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
    1      164.50     9.59        6.058         39.65
    2       83.21     9.39        6.141         17.20

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	244.26	9.39	6.141
2	246.58	9.59	6.058

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 246.58 Tc(MIN.) = 9.59
TOTAL AREA(ACRES) = 56.85
LONGEST FLOWPATH FROM NODE 2637.00 TO NODE 2612.00 = 2535.00 FEET.

****
FLOW PROCESS FROM NODE 2612.00 TO NODE 2611.00 IS CODE = 31

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 1306.00 DOWNSTREAM(FEET) = 1268.00
FLOW LENGTH(FEET) = 615.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 45.0 INCH PIPE IS 32.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 29.06
ESTIMATED PIPE DIAMETER(INCH) = 45.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 246.58
PIPE TRAVEL TIME(MIN.) = 0.35 Tc(MIN.) = 9.94
LONGEST FLOWPATH FROM NODE 2637.00 TO NODE 2611.00 = 3150.00 FEET.

****
FLOW PROCESS FROM NODE 2612.00 TO NODE 2611.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.918
*USER SPECIFIED(SUBAREA):
RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7800
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.7149
SUBAREA AREA(ACRES) = 8.27 SUBAREA RUNOFF(CFS) = 38.18
TOTAL AREA(ACRES) = 65.12 TOTAL RUNOFF(CFS) = 275.50
TC(MIN.) = 9.94

****
FLOW PROCESS FROM NODE 2611.00 TO NODE 2610.00 IS CODE = 31

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 1268.00 DOWNSTREAM(FEET) = 1250.00
FLOW LENGTH(FEET) = 450.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 51.0 INCH PIPE IS 36.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 25.39
ESTIMATED PIPE DIAMETER(INCH) = 51.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 275.50
PIPE TRAVEL TIME(MIN.) = 0.30 Tc(MIN.) = 10.24
LONGEST FLOWPATH FROM NODE 2637.00 TO NODE 2610.00 = 3600.00 FEET.

****
FLOW PROCESS FROM NODE 2611.00 TO NODE 2610.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.807
*USER SPECIFIED(SUBAREA):
RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.7171
SUBAREA AREA(ACRES) = 2.72 SUBAREA RUNOFF(CFS) = 12.16

```
 TOTAL AREA(ACRES) =     67.84   TOTAL RUNOFF(CFS) =  282.51
 TC(MIN.) =  10.24

****************************************************************************
 FLOW PROCESS FROM NODE   2610.00 TO NODE   2610.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  10.24
 RAINFALL INTENSITY(INCH/HR) =   5.81
 TOTAL STREAM AREA(ACRES) =    67.84
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    282.51

****************************************************************************
 FLOW PROCESS FROM NODE   2610.20 TO NODE   2610.10 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1375.00
 DOWNSTREAM ELEVATION(FEET) =   1350.00
 ELEVATION DIFFERENCE(FEET) =     25.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
 SUBAREA RUNOFF(CFS) =      0.50
 TOTAL AREA(ACRES) =      0.27   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
 FLOW PROCESS FROM NODE   2610.10 TO NODE   2610.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1350.00  DOWNSTREAM(FEET) =   1245.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   520.00   CHANNEL SLOPE =  0.2019
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1610 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.50
 FLOW VELOCITY(FEET/SEC) =   2.25 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.86   Tc(MIN.) =  10.96
 LONGEST FLOWPATH FROM NODE   2610.20 TO NODE   2610.00 =   620.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2610.10 TO NODE   2610.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.559
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =     2.45   SUBAREA RUNOFF(CFS) =     3.40
 TOTAL AREA(ACRES) =      2.72   TOTAL RUNOFF(CFS) =    3.78
 TC(MIN.) =  10.96
```

```
**************************************************************************
 FLOW PROCESS FROM NODE   2610.00 TO NODE   2610.00 IS CODE =   1
--------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==========================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  10.96
 RAINFALL INTENSITY(INCH/HR) =   5.56
 TOTAL STREAM AREA(ACRES) =     2.72
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.78

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY      AREA
 NUMBER       (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
     1       282.51    10.24         5.807         67.84
     2         3.78    10.96         5.559          2.72

 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       286.04    10.24         5.807
     2       274.19    10.96         5.559

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    286.04   Tc(MIN.) =   10.24
 TOTAL AREA(ACRES) =     70.56
 LONGEST FLOWPATH FROM NODE   2637.00 TO NODE   2610.00 =  3600.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE   2610.00 TO NODE   2607.60 IS CODE =  31
--------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1250.00  DOWNSTREAM(FEET) =  1231.00
 FLOW LENGTH(FEET) =   275.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  45.0 INCH PIPE IS  35.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  31.07
 ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    286.04
 PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =  10.39
 LONGEST FLOWPATH FROM NODE   2637.00 TO NODE   2607.60 =  3875.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE   2610.00 TO NODE   2607.60 IS CODE =  81
--------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.754
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7009
 SUBAREA AREA(ACRES) =    1.85   SUBAREA RUNOFF(CFS) =    8.20
 TOTAL AREA(ACRES) =     72.41   TOTAL RUNOFF(CFS) =  292.03
 TC(MIN.) =  10.39

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

```
 FLOW PROCESS FROM NODE   2607.60 TO NODE   2607.50 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1231.00  DOWNSTREAM(FEET) =  1225.00
 FLOW LENGTH(FEET) =   315.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  57.0 INCH PIPE IS  45.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  19.13
 ESTIMATED PIPE DIAMETER(INCH) =  57.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    292.03
 PIPE TRAVEL TIME(MIN.) =   0.27    Tc(MIN.) =  10.66
 LONGEST FLOWPATH FROM NODE   2637.00 TO NODE   2607.50 =  4190.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2607.60 TO NODE   2607.50 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.658
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7028
 SUBAREA AREA(ACRES) =    2.08   SUBAREA RUNOFF(CFS) =    9.06
 TOTAL AREA(ACRES) =     74.49   TOTAL RUNOFF(CFS) =  296.22
 TC(MIN.) =  10.66

****************************************************************************
 FLOW PROCESS FROM NODE   2607.50 TO NODE   2607.40 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1225.00  DOWNSTREAM(FEET) =  1215.00
 FLOW LENGTH(FEET) =   235.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  51.0 INCH PIPE IS  37.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  26.35
 ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    296.22
 PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =  10.81
 LONGEST FLOWPATH FROM NODE   2637.00 TO NODE   2607.40 =  4425.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2607.50 TO NODE   2607.40 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.608
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7048
 SUBAREA AREA(ACRES) =    2.24   SUBAREA RUNOFF(CFS) =    9.67
 TOTAL AREA(ACRES) =     76.73   TOTAL RUNOFF(CFS) =  303.26
 TC(MIN.) =  10.81

****************************************************************************
 FLOW PROCESS FROM NODE   2607.40 TO NODE   2607.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =  1215.00  DOWNSTREAM(FEET) =  1201.00
 FLOW LENGTH(FEET) =   175.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  45.0 INCH PIPE IS  34.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  33.39
 ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    303.26
 PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =  10.90
 LONGEST FLOWPATH FROM NODE   2637.00 TO NODE   2607.00 =  4600.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2607.00 TO NODE   2607.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  10.90
 RAINFALL INTENSITY(INCH/HR) =   5.58
 TOTAL STREAM AREA(ACRES) =    76.73
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    303.26

****************************************************************************
 FLOW PROCESS FROM NODE   2607.30 TO NODE   2607.20 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1390.00
 DOWNSTREAM ELEVATION(FEET) =   1350.00
 ELEVATION DIFFERENCE(FEET) =     40.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
 SUBAREA RUNOFF(CFS) =      0.77
 TOTAL AREA(ACRES) =      0.42   TOTAL RUNOFF(CFS) =      0.77

****************************************************************************
 FLOW PROCESS FROM NODE   2607.20 TO NODE   2607.10 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1350.00  DOWNSTREAM(FEET) =   1210.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   440.00   CHANNEL SLOPE =  0.3182
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1995 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.77
 FLOW VELOCITY(FEET/SEC) =   2.50 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.93   Tc(MIN.) =  10.03
 LONGEST FLOWPATH FROM NODE   2607.30 TO NODE   2607.10 =   540.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2607.20 TO NODE   2607.10 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.884
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =     5.09   SUBAREA RUNOFF(CFS) =     7.49
  TOTAL AREA(ACRES) =       5.51   TOTAL RUNOFF(CFS) =     8.11
  TC(MIN.) =  10.03

****************************************************************************
  FLOW PROCESS FROM NODE   2607.10 TO NODE   2607.00 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) =  1201.00
  FLOW LENGTH(FEET) =   380.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.68
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      8.11
  PIPE TRAVEL TIME(MIN.) =   1.11    Tc(MIN.) =  11.15
  LONGEST FLOWPATH FROM NODE   2607.30 TO NODE   2607.00 =   920.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2607.00 TO NODE   2607.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  11.15
  RAINFALL INTENSITY(INCH/HR) =   5.50
  TOTAL STREAM AREA(ACRES) =     5.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.11

  ** CONFLUENCE DATA **
  STREAM      RUNOFF       Tc       INTENSITY      AREA
  NUMBER       (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
     1        303.26    10.90         5.579         76.73
     2          8.11    11.15         5.498          5.51

  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        311.18    10.90         5.579
     2        306.95    11.15         5.498

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    311.18   Tc(MIN.) =   10.90
  TOTAL AREA(ACRES) =     82.24
  LONGEST FLOWPATH FROM NODE   2637.00 TO NODE   2607.00 =  4600.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2607.00 TO NODE   2606.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1201.00  DOWNSTREAM(FEET) =  1188.00
  FLOW LENGTH(FEET) =   200.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  35.5 INCHES
```

```
 PIPE-FLOW VELOCITY(FEET/SEC.) =  31.27
 ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    311.18
 PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =  11.00
 LONGEST FLOWPATH FROM NODE   2637.00 TO NODE   2606.00 =  4800.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2606.10 TO NODE   2606.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.544
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.6779
 SUBAREA AREA(ACRES) =     3.22   SUBAREA RUNOFF(CFS) =   13.75
 TOTAL AREA(ACRES) =     85.46   TOTAL RUNOFF(CFS) =  321.18
 TC(MIN.) =  11.00

****************************************************************************
 FLOW PROCESS FROM NODE   2606.00 TO NODE   2604.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1188.00  DOWNSTREAM(FEET) =  1187.00
 FLOW LENGTH(FEET) =   115.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  69.0 INCH PIPE IS  54.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  14.67
 ESTIMATED PIPE DIAMETER(INCH) =  69.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    321.18
 PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =  11.14
 LONGEST FLOWPATH FROM NODE   2637.00 TO NODE   2604.00 =  4915.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2604.00 TO NODE   2604.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2609.30 TO NODE   2609.20 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3100
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1380.00
 DOWNSTREAM ELEVATION(FEET) =   1340.00
 ELEVATION DIFFERENCE(FEET) =     40.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.601
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.709
 SUBAREA RUNOFF(CFS) =      0.33
 TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.33

****************************************************************************
 FLOW PROCESS FROM NODE   2609.20 TO NODE   2609.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1340.00  DOWNSTREAM(FEET) =   1250.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   250.00   CHANNEL SLOPE =  0.3600
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2070 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.33
  FLOW VELOCITY(FEET/SEC) =   2.55 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.64   Tc(MIN.) =   8.24
  LONGEST FLOWPATH FROM NODE   2609.30 TO NODE   2609.00 =   350.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2609.20 TO NODE   2609.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.683
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2649
  SUBAREA AREA(ACRES) =     1.28   SUBAREA RUNOFF(CFS) =    2.22
  TOTAL AREA(ACRES) =       1.42   TOTAL RUNOFF(CFS) =    2.51
  TC(MIN.) =   8.24

****************************************************************************
  FLOW PROCESS FROM NODE   2609.10 TO NODE   2609.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.683
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5210
  SUBAREA AREA(ACRES) =     1.46   SUBAREA RUNOFF(CFS) =    7.51
  TOTAL AREA(ACRES) =       2.88   TOTAL RUNOFF(CFS) =   10.03
  TC(MIN.) =   8.24

****************************************************************************
  FLOW PROCESS FROM NODE   2609.00 TO NODE   2608.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1240.00  DOWNSTREAM(FEET) =  1238.00
  FLOW LENGTH(FEET) =   180.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.77
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     10.03
  PIPE TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =   8.68
  LONGEST FLOWPATH FROM NODE   2609.30 TO NODE   2608.00 =   530.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2608.00 TO NODE   2608.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   8.68
```

```
 RAINFALL INTENSITY(INCH/HR) =   6.46
 TOTAL STREAM AREA(ACRES) =     2.88
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.03

****************************************************************************
 FLOW PROCESS FROM NODE   2608.30 TO NODE   2608.20 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1340.00
 DOWNSTREAM ELEVATION(FEET) =   1336.00
 ELEVATION DIFFERENCE(FEET) =      4.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.426
 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) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      2.48
 TOTAL AREA(ACRES) =      0.34   TOTAL RUNOFF(CFS) =      2.48

****************************************************************************
 FLOW PROCESS FROM NODE   2608.20 TO NODE   2608.10 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1336.00  DOWNSTREAM ELEVATION(FEET) = 1280.00
 STREET LENGTH(FEET) =   545.00   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) =   0.0130
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.78
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.25
   HALFSTREET FLOOD WIDTH(FEET) =    6.22
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.71
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.68
 STREET FLOW TRAVEL TIME(MIN.) =   1.35   Tc(MIN.) =   4.78
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.790
 SUBAREA AREA(ACRES) =     1.18      SUBAREA RUNOFF(CFS) =    8.60
 TOTAL AREA(ACRES) =      1.52        PEAK FLOW RATE(CFS) =      11.07

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.28   HALFSTREET FLOOD WIDTH(FEET) =   7.92
```

```
 FLOW VELOCITY(FEET/SEC.) =  7.43   DEPTH*VELOCITY(FT*FT/SEC.) =   2.12
 LONGEST FLOWPATH FROM NODE   2608.30 TO NODE   2608.10 =   645.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2608.40 TO NODE   2608.10 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4630
 SUBAREA AREA(ACRES) =     4.40   SUBAREA RUNOFF(CFS) =   14.20
 TOTAL AREA(ACRES) =       5.92   TOTAL RUNOFF(CFS) =   25.27
 TC(MIN.) =   4.78

****************************************************************************
 FLOW PROCESS FROM NODE   2608.10 TO NODE   2608.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1274.00  DOWNSTREAM(FEET) =  1238.00
 FLOW LENGTH(FEET) =   255.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  22.75
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     25.27
 PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =   4.97
 LONGEST FLOWPATH FROM NODE   2608.30 TO NODE   2608.00 =   900.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2608.00 TO NODE   2608.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   4.97
 RAINFALL INTENSITY(INCH/HR) =   9.22
 TOTAL STREAM AREA(ACRES) =     5.92
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     25.27

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY      AREA
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
     1        10.03      8.68         6.461          2.88
     2        25.27      4.97         9.222          5.92

 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        31.01      4.97         9.222
     2        27.74      8.68         6.461

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     31.01   Tc(MIN.) =    4.97
```

```
 TOTAL AREA(ACRES) =      8.80
 LONGEST FLOWPATH FROM NODE   2608.30 TO NODE   2608.00 =   900.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2608.00 TO NODE   2605.50 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1238.00  DOWNSTREAM(FEET) =  1234.00
 FLOW LENGTH(FEET) =   640.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  33.0 INCH PIPE IS  22.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.39
 ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     31.01
 PIPE TRAVEL TIME(MIN.) =   1.44    Tc(MIN.) =   6.41
 LONGEST FLOWPATH FROM NODE   2608.30 TO NODE   2605.50 =  1540.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2608.00 TO NODE   2605.50 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.856
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5988
 SUBAREA AREA(ACRES) =    6.01   SUBAREA RUNOFF(CFS) =   36.36
 TOTAL AREA(ACRES) =     14.81   TOTAL RUNOFF(CFS) =   69.68
 TC(MIN.) =   6.41

****************************************************************************
 FLOW PROCESS FROM NODE   2605.50 TO NODE   2605.40 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1234.00  DOWNSTREAM(FEET) =  1232.00
 FLOW LENGTH(FEET) =   350.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  42.0 INCH PIPE IS  33.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.54
 ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     69.68
 PIPE TRAVEL TIME(MIN.) =   0.68    Tc(MIN.) =   7.09
 LONGEST FLOWPATH FROM NODE   2608.30 TO NODE   2605.40 =  1890.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2605.50 TO NODE   2605.40 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.360
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.6471
 SUBAREA AREA(ACRES) =    5.82   SUBAREA RUNOFF(CFS) =   32.98
 TOTAL AREA(ACRES) =     20.63   TOTAL RUNOFF(CFS) =   98.25
 TC(MIN.) =   7.09

****************************************************************************
 FLOW PROCESS FROM NODE   2605.40 TO NODE   2605.30 IS CODE =  31
```

```
------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1232.00  DOWNSTREAM(FEET) =  1228.00
  FLOW LENGTH(FEET) =   700.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  37.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.33
  ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     98.25
  PIPE TRAVEL TIME(MIN.) =   1.25    Tc(MIN.) =   8.34
  LONGEST FLOWPATH FROM NODE   2608.30 TO NODE   2605.30 =  2590.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2605.40 TO NODE   2605.30 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.628
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6865
  SUBAREA AREA(ACRES) =    9.74   SUBAREA RUNOFF(CFS) =   49.71
  TOTAL AREA(ACRES) =     30.37   TOTAL RUNOFF(CFS) =  138.19
  TC(MIN.) =   8.34

****************************************************************************
  FLOW PROCESS FROM NODE   2605.30 TO NODE   2605.20 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1228.00  DOWNSTREAM(FEET) =  1223.00
  FLOW LENGTH(FEET) =   355.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  34.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.46
  ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    138.19
  PIPE TRAVEL TIME(MIN.) =   0.41    Tc(MIN.) =   8.75
  LONGEST FLOWPATH FROM NODE   2608.30 TO NODE   2605.20 =  2945.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2605.30 TO NODE   2605.20 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.426
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6922
  SUBAREA AREA(ACRES) =    2.20   SUBAREA RUNOFF(CFS) =   10.89
  TOTAL AREA(ACRES) =     32.57   TOTAL RUNOFF(CFS) =  144.88
  TC(MIN.) =   8.75

****************************************************************************
  FLOW PROCESS FROM NODE   2605.20 TO NODE   2605.10 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1223.00  DOWNSTREAM(FEET) =  1205.00
```

```
 FLOW LENGTH(FEET) =   340.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  36.0 INCH PIPE IS  29.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  23.48
 ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    144.88
 PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =   8.99
 LONGEST FLOWPATH FROM NODE   2608.30 TO NODE   2605.10 =  3285.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2605.20 TO NODE   2605.10 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.315
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.6966
 SUBAREA AREA(ACRES) =    1.95   SUBAREA RUNOFF(CFS) =    9.48
 TOTAL AREA(ACRES) =     34.52   TOTAL RUNOFF(CFS) =  151.84
 TC(MIN.) =   8.99

****************************************************************************
 FLOW PROCESS FROM NODE   2605.10 TO NODE   2605.00 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) =  1193.00
 FLOW LENGTH(FEET) =   305.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  39.0 INCH PIPE IS  31.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  21.35
 ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    151.84
 PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =   9.23
 LONGEST FLOWPATH FROM NODE   2608.30 TO NODE   2605.00 =  3590.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2605.10 TO NODE   2605.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.209
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7011
 SUBAREA AREA(ACRES) =    2.28   SUBAREA RUNOFF(CFS) =   10.90
 TOTAL AREA(ACRES) =     36.80   TOTAL RUNOFF(CFS) =  160.20
 TC(MIN.) =   9.23

****************************************************************************
 FLOW PROCESS FROM NODE   2605.00 TO NODE   2604.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1193.00  DOWNSTREAM(FEET) =  1187.00
 FLOW LENGTH(FEET) =   380.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  48.0 INCH PIPE IS  36.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  15.49
 ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    160.20
```

```
 PIPE TRAVEL TIME(MIN.) =   0.41    Tc(MIN.) =   9.64
 LONGEST FLOWPATH FROM NODE   2608.30 TO NODE   2604.00 =  3970.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2604.00 TO NODE   2604.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   9.64
 RAINFALL INTENSITY(INCH/HR) =   6.04
 TOTAL STREAM AREA(ACRES) =    36.80
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    160.20

****************************************************************************
 FLOW PROCESS FROM NODE   2604.30 TO NODE   2604.20 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1237.00
 DOWNSTREAM ELEVATION(FEET) =   1235.00
 ELEVATION DIFFERENCE(FEET) =      2.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.217
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    80.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      1.35
 TOTAL AREA(ACRES) =      0.19   TOTAL RUNOFF(CFS) =      1.35

****************************************************************************
 FLOW PROCESS FROM NODE   2604.20 TO NODE   2604.10 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1235.00  DOWNSTREAM ELEVATION(FEET) = 1217.00
 STREET LENGTH(FEET) =   485.00   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) =   0.0130
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.12
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.31
   HALFSTREET FLOOD WIDTH(FEET) =    9.18
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.75
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.47
 STREET FLOW TRAVEL TIME(MIN.) =   1.70   Tc(MIN.) =   5.92
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.271
*USER SPECIFIED(SUBAREA):
RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT =  0.770
SUBAREA AREA(ACRES) =     2.43      SUBAREA RUNOFF(CFS) =   15.48
TOTAL AREA(ACRES) =       2.62        PEAK FLOW RATE(CFS) =      16.69

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.36   HALFSTREET FLOOD WIDTH(FEET) =  11.85
FLOW VELOCITY(FEET/SEC.) =  5.48   DEPTH*VELOCITY(FT*FT/SEC.) =   1.99
LONGEST FLOWPATH FROM NODE   2604.30 TO NODE   2604.10 =   585.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   2604.10 TO NODE   2604.00 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =  1211.00  DOWNSTREAM(FEET) =  1187.00
FLOW LENGTH(FEET) =   400.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =  14.87
ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =     16.69
PIPE TRAVEL TIME(MIN.) =   0.45    Tc(MIN.) =   6.37
LONGEST FLOWPATH FROM NODE   2604.30 TO NODE   2604.00 =   985.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   2604.00 TO NODE   2604.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
TIME OF CONCENTRATION(MIN.) =   6.37
RAINFALL INTENSITY(INCH/HR) =   7.89
TOTAL STREAM AREA(ACRES) =     2.62
PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.69

** CONFLUENCE DATA **
STREAM      RUNOFF       Tc       INTENSITY       AREA
NUMBER       (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
    1       160.20     9.64         6.038          36.80
    2        16.69     6.37         7.890           2.62

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       139.27     6.37         7.890
    2       172.97     9.64         6.038

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =    172.97   Tc(MIN.) =    9.64
TOTAL AREA(ACRES) =     39.42
LONGEST FLOWPATH FROM NODE   2608.30 TO NODE   2604.00 =  3970.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   2604.10 TO NODE   2604.00 IS CODE =  81
```

```
------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.038
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7147
  SUBAREA AREA(ACRES) =    6.43   SUBAREA RUNOFF(CFS) =   29.89
  TOTAL AREA(ACRES) =     45.85   TOTAL RUNOFF(CFS) =  197.86
  TC(MIN.) =   9.64

************************************************************************
  FLOW PROCESS FROM NODE   2604.00 TO NODE   2604.00 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       197.86     9.64        6.038        45.85
  LONGEST FLOWPATH FROM NODE   2608.30 TO NODE   2604.00 =  3970.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc       INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)    (INCH/HOUR)   (ACRE)
     1       321.18    11.14        5.502        85.46
  LONGEST FLOWPATH FROM NODE   2637.00 TO NODE   2604.00 =  4915.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc       INTENSITY
  NUMBER     (CFS)     (MIN.)    (INCH/HOUR)
     1      475.93       9.64        6.038
     2      501.48      11.14        5.502

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    501.48   Tc(MIN.) =   11.14
  TOTAL AREA(ACRES) =    131.31

************************************************************************
  FLOW PROCESS FROM NODE   2604.00 TO NODE   2602.00 IS CODE =  31
------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1187.00  DOWNSTREAM(FEET) =  1145.00
  FLOW LENGTH(FEET) =   140.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  33.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  61.87
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    501.48
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =  11.17
  LONGEST FLOWPATH FROM NODE   2637.00 TO NODE   2602.00 =  5055.00 FEET.

************************************************************************
  FLOW PROCESS FROM NODE   2602.00 TO NODE   2601.00 IS CODE =  53
------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1145.00  DOWNSTREAM(FEET) =   1140.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   250.00   CHANNEL SLOPE =  0.0200
```

```
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0200 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =    501.48
 FLOW VELOCITY(FEET/SEC) =   6.28 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   0.66   Tc(MIN.) =  11.84
 LONGEST FLOWPATH FROM NODE   2637.00 TO NODE   2601.00 =  5305.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2602.00 TO NODE   2601.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.289
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4900
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.6842
 SUBAREA AREA(ACRES) =    4.46   SUBAREA RUNOFF(CFS) =   11.56
 TOTAL AREA(ACRES) =    135.77   TOTAL RUNOFF(CFS) =  501.48
 TC(MIN.) =  11.84
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE   2603.00 TO NODE   2601.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.289
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.6527
 SUBAREA AREA(ACRES) =   10.59   SUBAREA RUNOFF(CFS) =   14.00
 TOTAL AREA(ACRES) =    146.36   TOTAL RUNOFF(CFS) =  505.33
 TC(MIN.) =  11.84

****************************************************************************
 FLOW PROCESS FROM NODE   2601.00 TO NODE   2601.00 IS CODE =   7
----------------------------------------------------------------------------
 >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
 USER-SPECIFIED VALUES ARE AS FOLLOWS:
 TC(MIN) =  11.84   RAIN INTENSITY(INCH/HOUR) =  5.29
 TOTAL AREA(ACRES) =   146.36   TOTAL RUNOFF(CFS) =    137.90

****************************************************************************
 FLOW PROCESS FROM NODE   2601.00 TO NODE     26.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1140.00  DOWNSTREAM(FEET) =    975.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1430.00   CHANNEL SLOPE =  0.1154
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1115 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =    137.90
 FLOW VELOCITY(FEET/SEC) =   9.65 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.47   Tc(MIN.) =  14.31
 LONGEST FLOWPATH FROM NODE   2637.00 TO NODE     26.00 =  6735.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2601.00 TO NODE     26.00 IS CODE =  81
----------------------------------------------------------------------------
```

```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.680
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.1911
  SUBAREA AREA(ACRES) =   32.01   SUBAREA RUNOFF(CFS) =   37.45
  TOTAL AREA(ACRES) =    178.37   TOTAL RUNOFF(CFS) =  159.48
  TC(MIN.) =  14.31
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =    178.37  TC(MIN.) =     14.31
  PEAK FLOW RATE(CFS)    =    159.48
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS

```

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Job Name:
Merriam Mountains - Proposed Hydrology

Job #:
2469.01A

Date:
October 2006

Run Name:
MER27-PD

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Land Use	Runoff Coeff.	Area (ac.)	Comments
2747	2746	2	1,508.0	1,505.5	100.0	7	0.79	0.24	
2746	2745	6	1,505.0	1,486.5	505.0	7	0.79	3.28	
2745	2744	3	1,482.0	1,447.0	400.0				
2745	2744	8					0.79	2.83	
2744	2740	3	1,446.9	1,417.0	275.0				
2744	2740	8					0.79	2.47	
2740	2740	1							1 of 2
2743	2742	2	1,607.0	1,580.0	100.0	21	0.35	0.2	
2742	2741	5	1,580.0	1,440.0	455.0				
2742	2741	8				21	0.35	7.3	
2741	2740	3	1,437.0	1,418.0	250.0				
2740	2740	1							2 of 2
2740	2734	3	1,417.9	1,350.0	272.0				
2735	2734	8				21	0.32	2.44	
2734	2734	7							DET OUT Q = 13 CFS
2734	2731	5	1,350.0	1,300.0	445.0				
2734	2731	8				21	0.25	4	
2731	2731	1							1 of 2
2733	2732	2	1,750.0	1,728.0	100.0	21	0.35	0.2	
2732	2731	5	1,728.0	1,300.0	1,250.0				
2731	2731	8				21	0.33	15.61	
2731	2731	1							2 of 2
2731	2730	5	1,300.0	1,175.0	1,195.0				
2731	2730	8				21	0.33	25.26	
2730	2724	5	1,175.0	1,042.0	945.0				
2730	2724	8				21	0.25	11.85	
2724	2724	1							1 of 2
2728	2727	2	1,437.5	1,435.0	100.0	21	0.25	0.14	
2727	2726	5	1,435.0	1,398.0	320.0				
2727	2726	8				21	0.25	1.76	
2726	2725	5	1,398.0	1,305.0	600.0				
2726	2725	8				21	0.25	5.55	
2725	2724	5	1,305.0	1,042.0	1,342.0				
2725	2724	8				21	0.25	16.86	
2724	2724	1							2 of 2
2724	2723	5	1,042.0	973.0	1,200.0				
2724	2723	8				21	0.28	21.23	
2723	2719	5	973.0	973.0	925.0				
2723	2719	8				21	0.29	16.81	
2719	2719	1							1 of 2
2722	2721	2	1,160.0	1,137.5	100.0	21	0.25	0.16	
2721	2720	5	1,137.5	1,037.0	436.0				
2721	2720	8				21	0.25	14.39	

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Job Name:
Merriam Mountains - Proposed Hydrology

Job #:
2469.01A

Date:
October 2006

Run Name:
MER27-PD

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Land Use	Runoff Coeff.	Area (ac.)	Comments
2720	2719	5	1,037.0	937.0	986.0				
2720	2719	8				21	0.26	14.24	
2719	2719	1							2 of 2
2719	27	5	937.0	920.0	390.0				
2719	27	8				21	0.33	3.57	
27	27	10							Bank #1
2718	2717	2	1,445.0	1,440.0	100.0	21	0.25	0.35	
2717	2716	5	1,440.0	1,391.0	318.0				
2717	2716	8				21	0.25	1.97	
2716	2712	5	1,391.0	1,173.0	845.0				
2716	2712	8				21	0.25	8.79	
2712	2712	1							1 of 2
2715	2714	2	1,300.0	1,295.0	100.0	21	0.25	0.31	
2714	2713	5	1,295.0	1,225.0	430.0				
2714	2713	8				21	0.25	5.52	
2713	2712	5	1,225.0	1,173.0	660.0				
2713	2712	8				21	0.25	15.96	
2712	2712	1							2 of 2
2712	2711	5	1,173.0	1,105.0	665.0				
2712	2711	8				21	0.25	10.99	
2711	27	5	1,105.0	920.0	1,560.0				
2711	27	8				21	0.26	18.2	
27	27	11							Add Bank #1
								232.48	Total Area

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

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                        2003,1985,1981 HYDROLOGY MANUAL
       (c) Copyright 1982-2004 Advanced Engineering Software (aes)
           Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                          Analysis prepared by:

                     FUSCOE ENGINEERING - SAN DIEGO, INC.
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                         SAN DIEGO, CALIFORNIA 92122
                              (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 27 - WITH DETENTION STORAGE ROUTING                          *
* 2469.01A - OCTOBER 2006                                                 *
 *************************************************************************

  FILE NAME: MER27-PD.DAT
  TIME/DATE OF STUDY: 08:46 10/03/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   2747.00 TO NODE   2746.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1508.00
  DOWNSTREAM ELEVATION(FEET) =   1505.50
  ELEVATION DIFFERENCE(FEET) =      2.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.791
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
```

```
          THE MAXIMUM OVERLAND FLOW LENGTH =    85.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) =      1.75
TOTAL AREA(ACRES) =      0.24   TOTAL RUNOFF(CFS) =      1.75

****************************************************************************
 FLOW PROCESS FROM NODE   2746.00 TO NODE   2745.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1505.00  DOWNSTREAM ELEVATION(FEET) = 1486.50
 STREET LENGTH(FEET) =   505.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 16.00

 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(curb-to-curb) =   0.0130
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.10
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.34
   HALFSTREET FLOOD WIDTH(FEET) =   10.71
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.17
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.76
 STREET FLOW TRAVEL TIME(MIN.) =   1.63   Tc(MIN.) =   5.42
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.756
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.790
 SUBAREA AREA(ACRES) =     3.28      SUBAREA RUNOFF(CFS) =   22.69
 TOTAL AREA(ACRES) =      3.52        PEAK FLOW RATE(CFS) =      24.35

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.40   HALFSTREET FLOOD WIDTH(FEET) =  13.89
 FLOW VELOCITY(FEET/SEC.) =  5.94   DEPTH*VELOCITY(FT*FT/SEC.) =   2.40
 LONGEST FLOWPATH FROM NODE   2747.00 TO NODE   2745.00 =   605.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2745.00 TO NODE   2744.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1482.00  DOWNSTREAM(FEET) =  1447.00
 FLOW LENGTH(FEET) =   400.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  18.63
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     24.35
 PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =   5.78
 LONGEST FLOWPATH FROM NODE   2747.00 TO NODE   2744.00 =  1005.00 FEET.

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

```
 FLOW PROCESS FROM NODE    2745.00 TO NODE    2744.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.402
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7900
 SUBAREA AREA(ACRES) =     2.83   SUBAREA RUNOFF(CFS) =   18.78
 TOTAL AREA(ACRES) =       6.35   TOTAL RUNOFF(CFS) =   42.15
 TC(MIN.) =   5.78

****************************************************************************
 FLOW PROCESS FROM NODE    2744.00 TO NODE    2740.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1446.90  DOWNSTREAM(FEET) =  1417.00
 FLOW LENGTH(FEET) =   275.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  23.13
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     42.15
 PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =   5.97
 LONGEST FLOWPATH FROM NODE   2747.00 TO NODE   2740.00 =  1280.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    2744.00 TO NODE    2740.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.221
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7900
 SUBAREA AREA(ACRES) =     2.47   SUBAREA RUNOFF(CFS) =   16.04
 TOTAL AREA(ACRES) =       8.82   TOTAL RUNOFF(CFS) =   57.29
 TC(MIN.) =   5.97

****************************************************************************
 FLOW PROCESS FROM NODE    2740.00 TO NODE    2740.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   5.97
 RAINFALL INTENSITY(INCH/HR) =   8.22
 TOTAL STREAM AREA(ACRES) =     8.82
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     57.29

****************************************************************************
 FLOW PROCESS FROM NODE    2743.00 TO NODE    2742.00 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) =   1607.00
 DOWNSTREAM ELEVATION(FEET) =   1580.00
 ELEVATION DIFFERENCE(FEET) =     27.00
 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) =  7.972
 SUBAREA RUNOFF(CFS) =      0.56
 TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      0.56

****************************************************************************
 FLOW PROCESS FROM NODE   2742.00 TO NODE   2741.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1580.00  DOWNSTREAM(FEET) =   1440.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   455.00   CHANNEL SLOPE =  0.3077
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1969 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.56
 FLOW VELOCITY(FEET/SEC) =   2.49 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.05   Tc(MIN.) =   9.32
 LONGEST FLOWPATH FROM NODE   2743.00 TO NODE   2741.00 =   555.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2742.00 TO NODE   2741.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.172
 *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) =     7.30   SUBAREA RUNOFF(CFS) =   15.77
 TOTAL AREA(ACRES) =      7.50   TOTAL RUNOFF(CFS) =   16.20
 TC(MIN.) =   9.32

****************************************************************************
 FLOW PROCESS FROM NODE   2741.00 TO NODE   2740.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1437.00  DOWNSTREAM(FEET) =  1418.00
 FLOW LENGTH(FEET) =   250.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  16.18
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     16.20
 PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =   9.58
 LONGEST FLOWPATH FROM NODE   2743.00 TO NODE   2740.00 =   805.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2740.00 TO NODE   2740.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
```

```
 TIME OF CONCENTRATION(MIN.) =    9.58
 RAINFALL INTENSITY(INCH/HR) =    6.06
 TOTAL STREAM AREA(ACRES) =      7.50
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      16.20

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY       AREA
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)     (ACRE)
     1        57.29      5.97         8.221          8.82
     2        16.20      9.58         6.064          7.50

 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        67.39      5.97         8.221
     2        58.46      9.58         6.064

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      67.39   Tc(MIN.) =     5.97
 TOTAL AREA(ACRES) =      16.32
 LONGEST FLOWPATH FROM NODE   2747.00 TO NODE   2740.00 =  1280.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2740.00 TO NODE   2734.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1417.90  DOWNSTREAM(FEET) =  1350.00
 FLOW LENGTH(FEET) =   272.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  35.32
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      67.39
 PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =   6.10
 LONGEST FLOWPATH FROM NODE   2747.00 TO NODE   2734.00 =  1552.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2735.00 TO NODE   2734.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.109
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3200
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5530
 SUBAREA AREA(ACRES) =     2.44   SUBAREA RUNOFF(CFS) =     6.33
 TOTAL AREA(ACRES) =      18.76   TOTAL RUNOFF(CFS) =   84.12
 TC(MIN.) =   6.10

****************************************************************************
 FLOW PROCESS FROM NODE   2734.00 TO NODE   2734.00 IS CODE =   7
----------------------------------------------------------------------------
 >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
 USER-SPECIFIED VALUES ARE AS FOLLOWS:
 TC(MIN) =   6.10   RAIN INTENSITY(INCH/HOUR) =  8.11
 TOTAL AREA(ACRES) =    18.76   TOTAL RUNOFF(CFS) =     13.00
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    2734.00 TO NODE    2731.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1350.00  DOWNSTREAM(FEET) =   1300.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   445.00   CHANNEL SLOPE =  0.1124
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1093 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     13.00
  FLOW VELOCITY(FEET/SEC) =   4.35 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.71   Tc(MIN.) =   7.81
  LONGEST FLOWPATH FROM NODE   2747.00 TO NODE   2731.00 =  1997.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    2734.00 TO NODE    2731.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.919
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.1144
  SUBAREA AREA(ACRES) =    4.00   SUBAREA RUNOFF(CFS) =    6.92
  TOTAL AREA(ACRES) =     22.76   TOTAL RUNOFF(CFS) =   18.01
  TC(MIN.) =   7.81

****************************************************************************
  FLOW PROCESS FROM NODE    2731.00 TO NODE    2731.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   7.81
  RAINFALL INTENSITY(INCH/HR) =   6.92
  TOTAL STREAM AREA(ACRES) =    22.76
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     18.01

****************************************************************************
  FLOW PROCESS FROM NODE    2733.00 TO NODE    2732.00 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) =   1750.00
  DOWNSTREAM ELEVATION(FEET) =   1728.00
  ELEVATION DIFFERENCE(FEET) =     22.00
  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) =  7.972
  SUBAREA RUNOFF(CFS) =      0.56
  TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      0.56

****************************************************************************
  FLOW PROCESS FROM NODE    2732.00 TO NODE    2731.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1728.00  DOWNSTREAM(FEET) =   1300.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1250.00   CHANNEL SLOPE =  0.3424
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .2039 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.56
  FLOW VELOCITY(FEET/SEC) =   2.53 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   8.24   Tc(MIN.) =  14.50
  LONGEST FLOWPATH FROM NODE   2733.00 TO NODE   2731.00 =  1350.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2731.00 TO NODE   2731.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.639
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3303
  SUBAREA AREA(ACRES) =   15.61   SUBAREA RUNOFF(CFS) =   23.90
  TOTAL AREA(ACRES) =     15.81   TOTAL RUNOFF(CFS) =   24.22
  TC(MIN.) =  14.50

****************************************************************************
  FLOW PROCESS FROM NODE   2731.00 TO NODE   2731.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  14.50
  RAINFALL INTENSITY(INCH/HR) =   4.64
  TOTAL STREAM AREA(ACRES) =    15.81
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     24.22

  ** CONFLUENCE DATA **
  STREAM      RUNOFF       Tc       INTENSITY      AREA
  NUMBER       (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
      1        18.01      7.81         6.919         22.76
      2        24.22     14.50         4.639         15.81

  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        31.04      7.81         6.919
      2        36.30     14.50         4.639

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     36.30   Tc(MIN.) =   14.50
  TOTAL AREA(ACRES) =     38.57
  LONGEST FLOWPATH FROM NODE   2747.00 TO NODE   2731.00 =  1997.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2731.00 TO NODE   2730.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1300.00  DOWNSTREAM(FEET) =   1175.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1195.00   CHANNEL SLOPE =  0.1046
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1035 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     36.30
  FLOW VELOCITY(FEET/SEC) =   5.96 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.34   Tc(MIN.) =  17.85
  LONGEST FLOWPATH FROM NODE   2747.00 TO NODE   2730.00 =  3192.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2731.00 TO NODE   2730.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.058
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2532
  SUBAREA AREA(ACRES) =   25.26   SUBAREA RUNOFF(CFS) =   33.83
  TOTAL AREA(ACRES) =     63.83   TOTAL RUNOFF(CFS) =   65.58
  TC(MIN.) =  17.85

****************************************************************************
  FLOW PROCESS FROM NODE   2730.00 TO NODE   2724.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1175.00  DOWNSTREAM(FEET) =   1042.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   945.00   CHANNEL SLOPE =  0.1407
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1288 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     65.58
  FLOW VELOCITY(FEET/SEC) =   8.09 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.95   Tc(MIN.) =  19.79
  LONGEST FLOWPATH FROM NODE   2747.00 TO NODE   2724.00 =  4137.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2730.00 TO NODE   2724.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.796
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2527
  SUBAREA AREA(ACRES) =   11.85   SUBAREA RUNOFF(CFS) =   11.25
  TOTAL AREA(ACRES) =     75.68   TOTAL RUNOFF(CFS) =   72.60
  TC(MIN.) =  19.79

****************************************************************************
  FLOW PROCESS FROM NODE   2724.00 TO NODE   2724.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  19.79
  RAINFALL INTENSITY(INCH/HR) =   3.80
```

```
 TOTAL STREAM AREA(ACRES) =    75.68
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     72.60

****************************************************************************
 FLOW PROCESS FROM NODE   2728.00 TO NODE   2727.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1437.50
 DOWNSTREAM ELEVATION(FEET) =   1435.00
 ELEVATION DIFFERENCE(FEET) =      2.50
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =   10.842
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    92.50
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.597
 SUBAREA RUNOFF(CFS) =      0.20
 TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.20

****************************************************************************
 FLOW PROCESS FROM NODE   2727.00 TO NODE   2726.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1435.00  DOWNSTREAM(FEET) =   1398.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   320.00   CHANNEL SLOPE =  0.1156
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1117 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.20
 FLOW VELOCITY(FEET/SEC) =   1.87 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.85   Tc(MIN.) =  13.69
 LONGEST FLOWPATH FROM NODE   2728.00 TO NODE   2726.00 =   420.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2727.00 TO NODE   2726.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.815
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =     1.76   SUBAREA RUNOFF(CFS) =     2.12
 TOTAL AREA(ACRES) =      1.90   TOTAL RUNOFF(CFS) =    2.29
 TC(MIN.) =  13.69

****************************************************************************
 FLOW PROCESS FROM NODE   2726.00 TO NODE   2725.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1398.00  DOWNSTREAM(FEET) =   1305.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.1550
 SLOPE ADJUSTMENT CURVE USED:
```

```
 EFFECTIVE SLOPE = .1375 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      2.29
 FLOW VELOCITY(FEET/SEC) =   2.74 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.66   Tc(MIN.) =  17.35
 LONGEST FLOWPATH FROM NODE   2728.00 TO NODE   2725.00 =  1020.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2726.00 TO NODE   2725.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.134
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =     5.55   SUBAREA RUNOFF(CFS) =    5.74
 TOTAL AREA(ACRES) =       7.45   TOTAL RUNOFF(CFS) =    7.70
 TC(MIN.) =  17.35

****************************************************************************
 FLOW PROCESS FROM NODE   2725.00 TO NODE   2724.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1305.00  DOWNSTREAM(FEET) =   1042.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1342.00   CHANNEL SLOPE =  0.1960
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1580 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      7.70
 FLOW VELOCITY(FEET/SEC) =   4.39 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   5.09   Tc(MIN.) =  22.44
 LONGEST FLOWPATH FROM NODE   2728.00 TO NODE   2724.00 =  2362.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2725.00 TO NODE   2724.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.501
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =    16.86   SUBAREA RUNOFF(CFS) =   14.76
 TOTAL AREA(ACRES) =      24.31   TOTAL RUNOFF(CFS) =   21.28
 TC(MIN.) =  22.44

****************************************************************************
 FLOW PROCESS FROM NODE   2724.00 TO NODE   2724.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  22.44
 RAINFALL INTENSITY(INCH/HR) =   3.50
 TOTAL STREAM AREA(ACRES) =    24.31
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     21.28

 ** CONFLUENCE DATA **
```

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	72.60	19.79	3.796	75.68
2	21.28	22.44	3.501	24.31

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	91.37	19.79	3.796
2	88.23	22.44	3.501

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 91.37 Tc(MIN.) = 19.79
TOTAL AREA(ACRES) = 99.99
LONGEST FLOWPATH FROM NODE 2747.00 TO NODE 2724.00 = 4137.00 FEET.

****
FLOW PROCESS FROM NODE 2724.00 TO NODE 2723.00 IS CODE = 53

>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 1042.00 DOWNSTREAM(FEET) = 973.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1200.00 CHANNEL SLOPE = 0.0575
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .0575 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 91.37
FLOW VELOCITY(FEET/SEC) = 6.04 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 3.31 Tc(MIN.) = 23.11
LONGEST FLOWPATH FROM NODE 2747.00 TO NODE 2723.00 = 5337.00 FEET.

****
FLOW PROCESS FROM NODE 2724.00 TO NODE 2723.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.436
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2800
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.2569
SUBAREA AREA(ACRES) = 21.23 SUBAREA RUNOFF(CFS) = 20.42
TOTAL AREA(ACRES) = 121.22 TOTAL RUNOFF(CFS) = 107.01
TC(MIN.) = 23.11

****
FLOW PROCESS FROM NODE 2723.00 TO NODE 2719.00 IS CODE = 53

>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 973.00 DOWNSTREAM(FEET) = 937.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 925.00 CHANNEL SLOPE = 0.0389
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .0389 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 107.01
FLOW VELOCITY(FEET/SEC) = 5.24 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 2.94 Tc(MIN.) = 26.05
LONGEST FLOWPATH FROM NODE 2747.00 TO NODE 2719.00 = 6262.00 FEET.

```
**************************************************************************
 FLOW PROCESS FROM NODE   2723.00 TO NODE   2719.00 IS CODE =  81
--------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.180
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2900
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2610
 SUBAREA AREA(ACRES) =   16.81   SUBAREA RUNOFF(CFS) =   15.50
 TOTAL AREA(ACRES) =    138.03   TOTAL RUNOFF(CFS) =  114.54
 TC(MIN.) =  26.05

**************************************************************************
 FLOW PROCESS FROM NODE   2719.00 TO NODE   2719.00 IS CODE =   1
--------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==========================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  26.05
 RAINFALL INTENSITY(INCH/HR) =   3.18
 TOTAL STREAM AREA(ACRES) =   138.03
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    114.54

**************************************************************************
 FLOW PROCESS FROM NODE   2722.00 TO NODE   2721.00 IS CODE =  21
--------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1160.00
 DOWNSTREAM ELEVATION(FEET) =   1137.50
 ELEVATION DIFFERENCE(FEET) =     22.50
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.102
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.353
 SUBAREA RUNOFF(CFS) =      0.29
 TOTAL AREA(ACRES) =      0.16   TOTAL RUNOFF(CFS) =      0.29

**************************************************************************
 FLOW PROCESS FROM NODE   2721.00 TO NODE   2720.00 IS CODE =  53
--------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1137.50  DOWNSTREAM(FEET) =   1037.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   436.00   CHANNEL SLOPE =  0.2305
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1735 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.29
 FLOW VELOCITY(FEET/SEC) =   2.33 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.12   Tc(MIN.) =  10.22
 LONGEST FLOWPATH FROM NODE   2722.00 TO NODE   2720.00 =   536.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE   2721.00 TO NODE   2720.00 IS CODE =  81
--------------------------------------------------------------------------
```

```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.816
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =    14.39   SUBAREA RUNOFF(CFS) =   20.92
  TOTAL AREA(ACRES) =      14.55   TOTAL RUNOFF(CFS) =   21.16
  TC(MIN.) =  10.22

****************************************************************************
  FLOW PROCESS FROM NODE   2720.00 TO NODE   2719.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1037.00  DOWNSTREAM(FEET) =    937.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   986.00   CHANNEL SLOPE =  0.1014
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1011 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     21.16
  FLOW VELOCITY(FEET/SEC) =   4.92 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.34   Tc(MIN.) =  13.56
  LONGEST FLOWPATH FROM NODE   2722.00 TO NODE   2719.00 =  1522.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2720.00 TO NODE   2719.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.846
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2549
  SUBAREA AREA(ACRES) =    14.24   SUBAREA RUNOFF(CFS) =   17.94
  TOTAL AREA(ACRES) =      28.79   TOTAL RUNOFF(CFS) =   35.57
  TC(MIN.) =  13.56

****************************************************************************
  FLOW PROCESS FROM NODE   2719.00 TO NODE   2719.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  13.56
  RAINFALL INTENSITY(INCH/HR) =   4.85
  TOTAL STREAM AREA(ACRES) =    28.79
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     35.57

  ** CONFLUENCE DATA **
  STREAM      RUNOFF       Tc       INTENSITY      AREA
  NUMBER       (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
      1       114.54    26.05         3.180        138.03
      2        35.57    13.56         4.846         28.79

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

  ** PEAK FLOW RATE TABLE **
```

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	110.74	13.56	4.846
2	137.89	26.05	3.180

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 137.89 Tc(MIN.) = 26.05
TOTAL AREA(ACRES) = 166.82
LONGEST FLOWPATH FROM NODE 2747.00 TO NODE 2719.00 = 6262.00 FEET.

****
FLOW PROCESS FROM NODE 2719.00 TO NODE 27.00 IS CODE = 53

>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 937.00 DOWNSTREAM(FEET) = 920.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 390.00 CHANNEL SLOPE = 0.0436
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .0436 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 137.89
FLOW VELOCITY(FEET/SEC) = 6.03 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 1.08 Tc(MIN.) = 27.13
LONGEST FLOWPATH FROM NODE 2747.00 TO NODE 27.00 = 6652.00 FEET.

****
FLOW PROCESS FROM NODE 2719.00 TO NODE 27.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.098
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3300
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.2614
SUBAREA AREA(ACRES) = 3.57 SUBAREA RUNOFF(CFS) = 3.65
TOTAL AREA(ACRES) = 170.39 TOTAL RUNOFF(CFS) = 137.98
TC(MIN.) = 27.13

****
FLOW PROCESS FROM NODE 27.00 TO NODE 27.00 IS CODE = 10

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

****
FLOW PROCESS FROM NODE 2718.00 TO NODE 2717.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 1445.00
DOWNSTREAM ELEVATION(FEET) = 1440.00
ELEVATION DIFFERENCE(FEET) = 5.00
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 8.948
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 6.335
SUBAREA RUNOFF(CFS) = 0.55
TOTAL AREA(ACRES) = 0.35 TOTAL RUNOFF(CFS) = 0.55

****

```
 FLOW PROCESS FROM NODE   2717.00 TO NODE   2716.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1440.00  DOWNSTREAM(FEET) =   1391.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   318.00   CHANNEL SLOPE =  0.1541
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1370 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.55
 FLOW VELOCITY(FEET/SEC) =   2.07 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.56   Tc(MIN.) =  11.50
 LONGEST FLOWPATH FROM NODE   2718.00 TO NODE   2716.00 =   418.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2717.00 TO NODE   2716.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.387
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =     1.97   SUBAREA RUNOFF(CFS) =    2.65
 TOTAL AREA(ACRES) =       2.32   TOTAL RUNOFF(CFS) =    3.12
 TC(MIN.) =  11.50

****************************************************************************
 FLOW PROCESS FROM NODE   2716.00 TO NODE   2712.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1391.00  DOWNSTREAM(FEET) =   1173.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   845.00   CHANNEL SLOPE =  0.2580
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1827 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      3.12
 FLOW VELOCITY(FEET/SEC) =   3.50 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   4.03   Tc(MIN.) =  15.53
 LONGEST FLOWPATH FROM NODE   2718.00 TO NODE   2712.00 =  1263.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2716.00 TO NODE   2712.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.439
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =     8.79   SUBAREA RUNOFF(CFS) =    9.76
 TOTAL AREA(ACRES) =      11.11   TOTAL RUNOFF(CFS) =   12.33
 TC(MIN.) =  15.53

****************************************************************************
 FLOW PROCESS FROM NODE   2712.00 TO NODE   2712.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
```

```
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  15.53
 RAINFALL INTENSITY(INCH/HR) =   4.44
 TOTAL STREAM AREA(ACRES) =    11.11
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.33

****************************************************************************
 FLOW PROCESS FROM NODE   2715.00 TO NODE   2714.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1300.00
 DOWNSTREAM ELEVATION(FEET) =   1295.00
 ELEVATION DIFFERENCE(FEET) =      5.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.948
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.335
 SUBAREA RUNOFF(CFS) =      0.49
 TOTAL AREA(ACRES) =     0.31   TOTAL RUNOFF(CFS) =      0.49

****************************************************************************
 FLOW PROCESS FROM NODE   2714.00 TO NODE   2713.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1295.00  DOWNSTREAM(FEET) =   1225.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   430.00   CHANNEL SLOPE =  0.1628
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1414 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.49
 FLOW VELOCITY(FEET/SEC) =   2.11 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.40   Tc(MIN.) =  12.35
 LONGEST FLOWPATH FROM NODE   2715.00 TO NODE   2713.00 =   530.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2714.00 TO NODE   2713.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.146
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =     5.52   SUBAREA RUNOFF(CFS) =     7.10
 TOTAL AREA(ACRES) =       5.83   TOTAL RUNOFF(CFS) =    7.50
 TC(MIN.) =  12.35

****************************************************************************
 FLOW PROCESS FROM NODE   2713.00 TO NODE   2712.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1225.00  DOWNSTREAM(FEET) =   1173.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   660.00   CHANNEL SLOPE =  0.0788
 SLOPE ADJUSTMENT CURVE USED:
```

```
 EFFECTIVE SLOPE = .0788 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      7.50
 FLOW VELOCITY(FEET/SEC) =   3.07 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.58   Tc(MIN.) =  15.93
 LONGEST FLOWPATH FROM NODE   2715.00 TO NODE   2712.00 =  1190.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2713.00 TO NODE   2712.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.368
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =   15.96   SUBAREA RUNOFF(CFS) =   17.43
 TOTAL AREA(ACRES) =     21.79   TOTAL RUNOFF(CFS) =   23.79
 TC(MIN.) =  15.93

****************************************************************************
 FLOW PROCESS FROM NODE   2712.00 TO NODE   2712.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  15.93
 RAINFALL INTENSITY(INCH/HR) =   4.37
 TOTAL STREAM AREA(ACRES) =    21.79
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     23.79

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY      AREA
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
    1        12.33     15.53         4.439         11.11
    2        23.79     15.93         4.368         21.79

 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        35.53     15.53         4.439
    2        35.92     15.93         4.368

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     35.92   Tc(MIN.) =   15.93
 TOTAL AREA(ACRES) =     32.90
 LONGEST FLOWPATH FROM NODE   2718.00 TO NODE   2712.00 =  1263.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2712.00 TO NODE   2711.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1173.00  DOWNSTREAM(FEET) =   1105.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   665.00   CHANNEL SLOPE =  0.1023
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1017 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
```

```
 CHANNEL FLOW THRU SUBAREA(CFS) =     35.92
 FLOW VELOCITY(FEET/SEC) =   5.89 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.88   Tc(MIN.) =  17.81
 LONGEST FLOWPATH FROM NODE   2718.00 TO NODE   2711.00 =  1928.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2712.00 TO NODE   2711.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.064
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =   10.99   SUBAREA RUNOFF(CFS) =   11.17
 TOTAL AREA(ACRES) =     43.89   TOTAL RUNOFF(CFS) =   44.59
 TC(MIN.) =  17.81

****************************************************************************
 FLOW PROCESS FROM NODE   2711.00 TO NODE     27.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1105.00  DOWNSTREAM(FEET) =    920.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1560.00   CHANNEL SLOPE =  0.1186
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1139 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     44.59
 FLOW VELOCITY(FEET/SEC) =   6.69 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.88   Tc(MIN.) =  21.70
 LONGEST FLOWPATH FROM NODE   2718.00 TO NODE     27.00 =  3488.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2711.00 TO NODE     27.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.578
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2529
 SUBAREA AREA(ACRES) =   18.20   SUBAREA RUNOFF(CFS) =   16.93
 TOTAL AREA(ACRES) =     62.09   TOTAL RUNOFF(CFS) =   56.20
 TC(MIN.) =  21.70

****************************************************************************
 FLOW PROCESS FROM NODE     27.00 TO NODE     27.00 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        56.20     21.70        3.578        62.09
 LONGEST FLOWPATH FROM NODE   2718.00 TO NODE     27.00 =  3488.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM      RUNOFF      Tc       INTENSITY      AREA
 NUMBER       (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
```

```
    1      137.98    27.13        3.098       170.39
 LONGEST FLOWPATH FROM NODE   2747.00 TO NODE     27.00 =  6652.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc       INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
    1      166.54      21.70        3.578
    2      186.63      27.13        3.098

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    186.63   Tc(MIN.) =   27.13
 TOTAL AREA(ACRES) =    232.48
================================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =    232.48  TC(MIN.) =     27.13
 PEAK FLOW RATE(CFS)    =    186.63
================================================================================
================================================================================
 END OF RATIONAL METHOD ANALYSIS
```

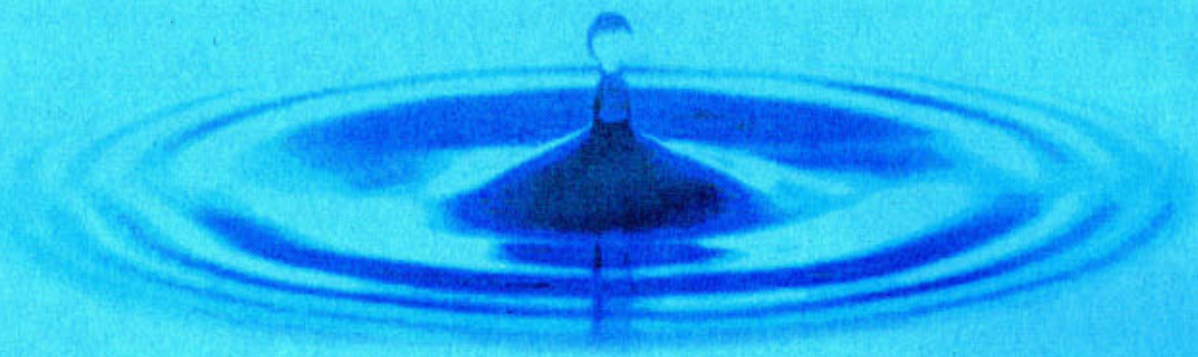
APPENDIX A

AES - 2005

Rational Method Hydrology

Proposed Condition

BASIN D



FUSCOE ENGINEERING
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www.fuscoe.com

Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR28-p

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2823	2822	2	1,702.0	1,695.0	100.0	0.35	0.33	
2822	2821	5	1,695.0	1,430.0	517.0			
2822	2821	8				0.35	3.06	
2821	2820	5	1,430.0	1,265.0	669.0			
2821	2820	8				0.35	11.46	Weighted C Value
2820	2811	5	1,265.0	1,145.0	650.0			
2820	2811	8				0.27	8.25	
2812	2811	8				0.32	9.5	
2811	2810	5	1,145.0	1,045.0	611.0			
2811	2810	8				0.26	9.27	Weighted C Value
2810	28	5	1,045.0	975.0	671.0			
2810	28	8				0.30	11.8	Weighted C Value
28	28	1						1 of 2
2807	2806	2	1,738.0	1,705.0	106.0	0.35	0.28	
2806	2805	5	1,705.0	1,500.0	455.0			
2806	2805	8				0.35	3.49	
2805	2804	5	1,500.0	1,200.0	1,117.0			
2805	2804	8				0.33	16.91	
2804	2803	5	1,200.0	1,073.0	885.0			
2804	2803	8				0.25	11.28	
2803	2801	5	1,073.0	985.0	558.0			
2803	2801	8				0.28	5.72	
2802	2801	8				0.29	16.01	
2801	28	5	985.0	975.0	360.0			
28	28	1						2 of 2
							107.36	Total Area

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

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2004 Advanced Engineering Software (aes)
              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

                        FUSCOE ENGINEERING - SAN DIEGO, INC.
                          6390 GREENWICH DRIVE, SUITE 170
                            SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 28                                                           *
* 2469.01A - OCTOBER 2006                                                 *
 *************************************************************************

  FILE NAME: MERR28-P.DAT
  TIME/DATE OF STUDY: 09:07 10/06/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   2823.00 TO NODE   2822.00 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) =   1702.00
  DOWNSTREAM ELEVATION(FEET) =   1695.00
  ELEVATION DIFFERENCE(FEET) =      7.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.058
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.383
```

```
 SUBAREA RUNOFF(CFS) =      0.85
 TOTAL AREA(ACRES) =      0.33   TOTAL RUNOFF(CFS) =      0.85

****************************************************************************
 FLOW PROCESS FROM NODE    2822.00 TO NODE    2821.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1695.00  DOWNSTREAM(FEET) =   1430.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   517.00   CHANNEL SLOPE =  0.5126
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2256 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.85
 FLOW VELOCITY(FEET/SEC) =   2.66 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.24   Tc(MIN.) =  10.30
 LONGEST FLOWPATH FROM NODE    2823.00 TO NODE    2821.00 =   617.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    2822.00 TO NODE    2821.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.787
 *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) =     3.06   SUBAREA RUNOFF(CFS) =     6.20
 TOTAL AREA(ACRES) =      3.39   TOTAL RUNOFF(CFS) =    6.87
 TC(MIN.) =  10.30

****************************************************************************
 FLOW PROCESS FROM NODE    2821.00 TO NODE    2820.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1430.00  DOWNSTREAM(FEET) =   1265.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   669.00   CHANNEL SLOPE =  0.2466
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1789 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      6.87
 FLOW VELOCITY(FEET/SEC) =   4.50 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.48   Tc(MIN.) =  12.78
 LONGEST FLOWPATH FROM NODE    2823.00 TO NODE    2820.00 =  1286.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    2821.00 TO NODE    2820.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.035
 *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) =    11.46   SUBAREA RUNOFF(CFS) =    20.20
 TOTAL AREA(ACRES) =     14.85   TOTAL RUNOFF(CFS) =   26.17
 TC(MIN.) =  12.78

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

```
 FLOW PROCESS FROM NODE    2820.00 TO NODE    2811.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1265.00  DOWNSTREAM(FEET) =   1145.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   650.00   CHANNEL SLOPE =  0.1846
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1523 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     26.17
 FLOW VELOCITY(FEET/SEC) =   6.48 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.67   Tc(MIN.) =  14.45
 LONGEST FLOWPATH FROM NODE    2823.00 TO NODE    2811.00 =  1936.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    2820.00 TO NODE    2811.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.651
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3214
 SUBAREA AREA(ACRES) =    8.25   SUBAREA RUNOFF(CFS) =   10.36
 TOTAL AREA(ACRES) =     23.10   TOTAL RUNOFF(CFS) =   34.54
 TC(MIN.) =  14.45

****************************************************************************
 FLOW PROCESS FROM NODE    2812.00 TO NODE    2811.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.651
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3190
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3207
 SUBAREA AREA(ACRES) =    9.50   SUBAREA RUNOFF(CFS) =   14.10
 TOTAL AREA(ACRES) =     32.60   TOTAL RUNOFF(CFS) =   48.63
 TC(MIN.) =  14.45

****************************************************************************
 FLOW PROCESS FROM NODE    2811.00 TO NODE    2810.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1145.00  DOWNSTREAM(FEET) =   1045.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   611.00   CHANNEL SLOPE =  0.1637
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1418 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     48.63
 FLOW VELOCITY(FEET/SEC) =   7.69 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.32   Tc(MIN.) =  15.77
 LONGEST FLOWPATH FROM NODE    2823.00 TO NODE    2810.00 =  2547.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    2811.00 TO NODE    2810.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.396
```

```
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
 S.C.S. CURVE NUMBER (AMC II) =  0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3073
 SUBAREA AREA(ACRES) =  9.27   SUBAREA RUNOFF(CFS) =  10.59
 TOTAL AREA(ACRES) =  41.87   TOTAL RUNOFF(CFS) =  56.55
 TC(MIN.) =  15.77

****************************************************************************
 FLOW PROCESS FROM NODE   2810.00 TO NODE    28.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1045.00  DOWNSTREAM(FEET) =  975.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  671.00   CHANNEL SLOPE =  0.1043
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1032 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =  56.55
 FLOW VELOCITY(FEET/SEC) =  6.90 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =  1.62   Tc(MIN.) =  17.39
 LONGEST FLOWPATH FROM NODE   2823.00 TO NODE    28.00 =  3218.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2810.00 TO NODE    28.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.127
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 S.C.S. CURVE NUMBER (AMC II) =  0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3057
 SUBAREA AREA(ACRES) =  11.80   SUBAREA RUNOFF(CFS) =  14.61
 TOTAL AREA(ACRES) =  53.67   TOTAL RUNOFF(CFS) =  67.70
 TC(MIN.) =  17.39

****************************************************************************
 FLOW PROCESS FROM NODE    28.00 TO NODE    28.00 IS CODE =  1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  17.39
 RAINFALL INTENSITY(INCH/HR) =  4.13
 TOTAL STREAM AREA(ACRES) =  53.67
 PEAK FLOW RATE(CFS) AT CONFLUENCE =  67.70

****************************************************************************
 FLOW PROCESS FROM NODE   2807.00 TO NODE   2806.00 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) =  106.00
 UPSTREAM ELEVATION(FEET) =  1738.00
 DOWNSTREAM ELEVATION(FEET) =  1705.00
 ELEVATION DIFFERENCE(FEET) =  33.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =  6.267
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
```

```
          THE MAXIMUM OVERLAND FLOW LENGTH =   100.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
SUBAREA RUNOFF(CFS) =      0.78
TOTAL AREA(ACRES) =      0.28   TOTAL RUNOFF(CFS) =      0.78

****************************************************************************
 FLOW PROCESS FROM NODE   2806.00 TO NODE   2805.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1705.00  DOWNSTREAM(FEET) =   1500.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   455.00   CHANNEL SLOPE =  0.4505
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2201 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.78
 FLOW VELOCITY(FEET/SEC) =   2.63 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.89   Tc(MIN.) =   9.15
 LONGEST FLOWPATH FROM NODE   2807.00 TO NODE   2805.00 =   561.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2806.00 TO NODE   2805.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.243
 *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) =     3.49   SUBAREA RUNOFF(CFS) =     7.63
 TOTAL AREA(ACRES) =      3.77   TOTAL RUNOFF(CFS) =    8.24
 TC(MIN.) =   9.15

****************************************************************************
 FLOW PROCESS FROM NODE   2805.00 TO NODE   2804.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1500.00  DOWNSTREAM(FEET) =   1200.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1117.00   CHANNEL SLOPE =  0.2686
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1862 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      8.24
 FLOW VELOCITY(FEET/SEC) =   4.88 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.82   Tc(MIN.) =  12.97
 LONGEST FLOWPATH FROM NODE   2807.00 TO NODE   2804.00 =  1678.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2805.00 TO NODE   2804.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.986
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3250
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3296
 SUBAREA AREA(ACRES) =   16.91   SUBAREA RUNOFF(CFS) =   27.40
```

```
 TOTAL AREA(ACRES) =     20.68   TOTAL RUNOFF(CFS) =   33.98
 TC(MIN.) =  12.97

****************************************************************************
 FLOW PROCESS FROM NODE   2804.00 TO NODE   2803.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1200.00  DOWNSTREAM(FEET) =   1073.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   885.00   CHANNEL SLOPE =  0.1435
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1307 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     33.98
 FLOW VELOCITY(FEET/SEC) =   6.55 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.25   Tc(MIN.) =  15.22
 LONGEST FLOWPATH FROM NODE   2807.00 TO NODE   2803.00 =  2563.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2804.00 TO NODE   2803.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.497
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2520
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3022
 SUBAREA AREA(ACRES) =   11.28   SUBAREA RUNOFF(CFS) =   12.78
 TOTAL AREA(ACRES) =     31.96   TOTAL RUNOFF(CFS) =   43.43
 TC(MIN.) =  15.22

****************************************************************************
 FLOW PROCESS FROM NODE     28.03 TO NODE   2801.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1073.00  DOWNSTREAM(FEET) =    985.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   558.00   CHANNEL SLOPE =  0.1577
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1389 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     43.43
 FLOW VELOCITY(FEET/SEC) =   7.33 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.27   Tc(MIN.) =  16.49
 LONGEST FLOWPATH FROM NODE   2807.00 TO NODE   2801.00 =  3121.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2803.00 TO NODE   2801.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.271
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2810
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2990
 SUBAREA AREA(ACRES) =    5.72   SUBAREA RUNOFF(CFS) =    6.86
 TOTAL AREA(ACRES) =     37.68   TOTAL RUNOFF(CFS) =   48.11
 TC(MIN.) =  16.49

****************************************************************************
 FLOW PROCESS FROM NODE   2802.00 TO NODE   2801.00 IS CODE =  81
```

```
------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.271
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2860
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2951
  SUBAREA AREA(ACRES) =    16.01   SUBAREA RUNOFF(CFS) =   19.55
  TOTAL AREA(ACRES) =      53.69   TOTAL RUNOFF(CFS) =   67.66
  TC(MIN.) =  16.49

************************************************************************
  FLOW PROCESS FROM NODE    2801.00 TO NODE     28.00 IS CODE =  52
------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    985.00  DOWNSTREAM(FEET) =    975.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   360.00   CHANNEL SLOPE =  0.0278
  CHANNEL FLOW THRU SUBAREA(CFS) =     67.66
  FLOW VELOCITY(FEET/SEC) =   7.04 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.85   Tc(MIN.) =  17.34
  LONGEST FLOWPATH FROM NODE   2807.00 TO NODE     28.00 =  3481.00 FEET.

************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     28.00 IS CODE =   1
------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  17.34
  RAINFALL INTENSITY(INCH/HR) =   4.13
  TOTAL STREAM AREA(ACRES) =    53.69
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     67.66

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
      1       67.70    17.39         4.127         53.67
      2       67.66    17.34         4.134         53.69

  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      135.18    17.34        4.134
      2      135.24    17.39        4.127

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    135.24   Tc(MIN.) =   17.39
  TOTAL AREA(ACRES) =    107.36
  LONGEST FLOWPATH FROM NODE   2807.00 TO NODE     28.00 =  3481.00 FEET.
========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =    107.36  TC(MIN.) =     17.39
  PEAK FLOW RATE(CFS)    =    135.24
========================================================================
========================================================================
```

END OF RATIONAL METHOD ANALYSIS

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR29-p

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
2927	2926	2	1,603.0	1,570.0	100.0	0.35	0.19	
2926	2925	5	1,570.0	1,470.0	307.0			
2926	2925	8				0.35	1.15	
2925	2924	5	1,470.0	1,390.0	520.0			
2925	2924	8				0.35	6.88	
2924	2922	5	1,390.0	1,370.0	361.0			
2923	2922	8				0.348	9.3	
2922	2921	5	1,370.0	1,300.0	1,235.0			
2922	2921	8				0.429	29.57	
2921	2920	5	1,300.0	893.0	1,300.0			
2921	2920	8				0.44	15.07	
2920	29	5	893.0	800.0	335.0			
2920	29	8				0.46	27.04	
29	29	1						1 of 2
2915	2914	2	1,550.0	1,460.0	90.0	0.35	1.38	
2914	2913	5	1,460.0	1,400.0	400.0			
2914	2913	8				0.35	5.2	
2913	2912	5	1,400.0	1,290.0	600.0			
2913	2912	8				0.35	5.12	
2912	2911	5	1,290.0	1,025.0	1,175.0			
2912	2911	8				0.433	19.17	
2911	2910	5	1,025.0	835.0	830.0			
2911	2910	8				0.425	23.79	
2910	29	5	835.0	800.0	455.0			2 of 2
29	29	1						
							143.86	Total Area

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

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                        2003,1985,1981 HYDROLOGY MANUAL
        (c) Copyright 1982-2004 Advanced Engineering Software (aes)
            Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                          Analysis prepared by:

                    FUSCOE ENGINEERING - SAN DIEGO, INC.
                      6390 GREENWICH DRIVE, SUITE 170
                        SAN DIEGO, CALIFORNIA 92122
                             (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 29                                                           *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MERR29-P.DAT
  TIME/DATE OF STUDY: 13:20 10/10/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67     2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   2927.00 TO NODE   2926.00 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) =   1603.00
  DOWNSTREAM ELEVATION(FEET) =   1570.00
  ELEVATION DIFFERENCE(FEET) =     33.00
  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) =  7.972
SUBAREA RUNOFF(CFS) =      0.53
TOTAL AREA(ACRES) =      0.19   TOTAL RUNOFF(CFS) =      0.53

****************************************************************************
 FLOW PROCESS FROM NODE   2926.00 TO NODE   2925.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1570.00  DOWNSTREAM(FEET) =   1470.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   307.00   CHANNEL SLOPE =  0.3257
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2010 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.53
 FLOW VELOCITY(FEET/SEC) =   2.51 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.04   Tc(MIN.) =   8.30
 LONGEST FLOWPATH FROM NODE   2927.00 TO NODE   2925.00 =   407.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2926.00 TO NODE   2925.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.648
 *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) =     1.15   SUBAREA RUNOFF(CFS) =    2.68
 TOTAL AREA(ACRES) =      1.34   TOTAL RUNOFF(CFS) =    3.12
 TC(MIN.) =   8.30

****************************************************************************
 FLOW PROCESS FROM NODE   2925.00 TO NODE   2924.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1470.00  DOWNSTREAM(FEET) =   1390.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   520.00   CHANNEL SLOPE =  0.1538
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1369 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      3.12
 FLOW VELOCITY(FEET/SEC) =   3.03 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.86   Tc(MIN.) =  11.17
 LONGEST FLOWPATH FROM NODE   2927.00 TO NODE   2924.00 =   927.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2925.00 TO NODE   2924.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.491
 *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) =     6.88   SUBAREA RUNOFF(CFS) =   13.22
 TOTAL AREA(ACRES) =      8.22   TOTAL RUNOFF(CFS) =   15.80
 TC(MIN.) =  11.17
```

```
****************************************************************************
 FLOW PROCESS FROM NODE   2924.00 TO NODE   2922.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1390.00  DOWNSTREAM(FEET) =   1370.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   361.00   CHANNEL SLOPE =  0.0554
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0554 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     15.80
 FLOW VELOCITY(FEET/SEC) =   3.30 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.82   Tc(MIN.) =  12.99
 LONGEST FLOWPATH FROM NODE   2927.00 TO NODE   2922.00 =  1288.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2923.00 TO NODE   2922.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.982
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3480
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3489
 SUBAREA AREA(ACRES) =    9.30   SUBAREA RUNOFF(CFS) =   16.12
 TOTAL AREA(ACRES) =     17.52   TOTAL RUNOFF(CFS) =   30.46
 TC(MIN.) =  12.99

****************************************************************************
 FLOW PROCESS FROM NODE   2922.00 TO NODE   2921.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1370.00  DOWNSTREAM(FEET) =   1300.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1235.00   CHANNEL SLOPE =  0.0567
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0567 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     30.46
 FLOW VELOCITY(FEET/SEC) =   4.16 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   4.95   Tc(MIN.) =  17.94
 LONGEST FLOWPATH FROM NODE   2927.00 TO NODE   2921.00 =  2523.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2922.00 TO NODE   2921.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.045
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4290
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3992
 SUBAREA AREA(ACRES) =   29.57   SUBAREA RUNOFF(CFS) =   51.32
 TOTAL AREA(ACRES) =     47.09   TOTAL RUNOFF(CFS) =   76.05
 TC(MIN.) =  17.94

****************************************************************************
 FLOW PROCESS FROM NODE   2921.00 TO NODE   2920.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1300.00  DOWNSTREAM(FEET) =    893.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1300.00   CHANNEL SLOPE =  0.3131
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1983 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     76.05
  FLOW VELOCITY(FEET/SEC) =  10.55 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.05   Tc(MIN.) =  19.99
  LONGEST FLOWPATH FROM NODE   2927.00 TO NODE   2920.00 =  3823.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2921.00 TO NODE   2920.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.772
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4400
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4091
  SUBAREA AREA(ACRES) =   15.07   SUBAREA RUNOFF(CFS) =   25.01
  TOTAL AREA(ACRES) =     62.16   TOTAL RUNOFF(CFS) =   95.92
  TC(MIN.) =  19.99

****************************************************************************
  FLOW PROCESS FROM NODE   2920.00 TO NODE     29.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    893.00  DOWNSTREAM(FEET) =    800.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   335.00   CHANNEL SLOPE =  0.2776
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1892 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     95.92
  FLOW VELOCITY(FEET/SEC) =  11.13 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.50   Tc(MIN.) =  20.49
  LONGEST FLOWPATH FROM NODE   2927.00 TO NODE     29.00 =  4158.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2920.00 TO NODE     29.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.712
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4245
  SUBAREA AREA(ACRES) =   27.04   SUBAREA RUNOFF(CFS) =   46.17
  TOTAL AREA(ACRES) =     89.20   TOTAL RUNOFF(CFS) =  140.58
  TC(MIN.) =  20.49

****************************************************************************
  FLOW PROCESS FROM NODE     29.00 TO NODE     29.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  20.49
  RAINFALL INTENSITY(INCH/HR) =   3.71
  TOTAL STREAM AREA(ACRES) =    89.20
```

```
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    140.58

****************************************************************************
 FLOW PROCESS FROM NODE   2915.00 TO NODE   2914.00 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) =    90.00
 UPSTREAM ELEVATION(FEET) =   1550.00
 DOWNSTREAM ELEVATION(FEET) =   1460.00
 ELEVATION DIFFERENCE(FEET) =     90.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.945
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.247
 SUBAREA RUNOFF(CFS) =      3.98
 TOTAL AREA(ACRES) =      1.38   TOTAL RUNOFF(CFS) =      3.98

****************************************************************************
 FLOW PROCESS FROM NODE   2914.00 TO NODE   2913.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1460.00  DOWNSTREAM(FEET) =   1400.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   400.00   CHANNEL SLOPE =  0.1500
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1350 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      3.98
 FLOW VELOCITY(FEET/SEC) =   3.26 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.04   Tc(MIN.) =   7.99
 LONGEST FLOWPATH FROM NODE   2915.00 TO NODE   2913.00 =   490.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2914.00 TO NODE   2913.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.816
 *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) =    5.20   SUBAREA RUNOFF(CFS) =   12.40
 TOTAL AREA(ACRES) =      6.58   TOTAL RUNOFF(CFS) =   15.70
 TC(MIN.) =   7.99

****************************************************************************
 FLOW PROCESS FROM NODE   2913.00 TO NODE   2912.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1400.00  DOWNSTREAM(FEET) =   1290.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.1833
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1517 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     15.70
 FLOW VELOCITY(FEET/SEC) =   5.46 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.83   Tc(MIN.) =   9.82
 LONGEST FLOWPATH FROM NODE   2915.00 TO NODE   2912.00 =  1090.00 FEET.
```

```
**************************************************************************
 FLOW PROCESS FROM NODE   2913.00 TO NODE   2912.00 IS CODE =  81
--------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.965
 *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) =    5.12   SUBAREA RUNOFF(CFS) =   10.69
 TOTAL AREA(ACRES) =     11.70   TOTAL RUNOFF(CFS) =   24.43
 TC(MIN.) =   9.82

**************************************************************************
 FLOW PROCESS FROM NODE   2912.00 TO NODE   2911.00 IS CODE =  53
--------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1290.00  DOWNSTREAM(FEET) =   1025.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1175.00   CHANNEL SLOPE =  0.2255
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1718 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     24.43
 FLOW VELOCITY(FEET/SEC) =   6.73 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.91   Tc(MIN.) =  12.73
 LONGEST FLOWPATH FROM NODE   2915.00 TO NODE   2911.00 =  2265.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE   2912.00 TO NODE   2911.00 IS CODE =  81
--------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.046
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4330
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4015
 SUBAREA AREA(ACRES) =   19.17   SUBAREA RUNOFF(CFS) =   41.89
 TOTAL AREA(ACRES) =     30.87   TOTAL RUNOFF(CFS) =   62.55
 TC(MIN.) =  12.73

**************************************************************************
 FLOW PROCESS FROM NODE   2911.00 TO NODE   2910.00 IS CODE =  53
--------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1025.00  DOWNSTREAM(FEET) =    835.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   830.00   CHANNEL SLOPE =  0.2289
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1730 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     62.55
 FLOW VELOCITY(FEET/SEC) =   9.23 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.50   Tc(MIN.) =  14.23
 LONGEST FLOWPATH FROM NODE   2915.00 TO NODE   2910.00 =  3095.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE   2911.00 TO NODE   2910.00 IS CODE =  81
--------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.697
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4250
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.4118
SUBAREA AREA(ACRES) =   23.79   SUBAREA RUNOFF(CFS) =   47.49
TOTAL AREA(ACRES) =     54.66   TOTAL RUNOFF(CFS) =  105.70
TC(MIN.) =  14.23

****************************************************************************
FLOW PROCESS FROM NODE   2910.00 TO NODE     29.00 IS CODE =  52
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    835.00  DOWNSTREAM(FEET) =    800.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   455.00   CHANNEL SLOPE =  0.0769
CHANNEL FLOW THRU SUBAREA(CFS) =    105.70
FLOW VELOCITY(FEET/SEC) =  13.39 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   0.57   Tc(MIN.) =  14.80
LONGEST FLOWPATH FROM NODE   2915.00 TO NODE     29.00 =  3550.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE     29.00 TO NODE     29.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
TIME OF CONCENTRATION(MIN.) =  14.80
RAINFALL INTENSITY(INCH/HR) =   4.58
TOTAL STREAM AREA(ACRES) =    54.66
PEAK FLOW RATE(CFS) AT CONFLUENCE =    105.70

** CONFLUENCE DATA **
STREAM      RUNOFF       Tc       INTENSITY      AREA
NUMBER       (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
    1       140.58    20.49        3.712         89.20
    2       105.70    14.80        4.580         54.66

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       207.21    14.80        4.580
    2       226.26    20.49        3.712

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =    226.26   Tc(MIN.) =   20.49
TOTAL AREA(ACRES) =    143.86
LONGEST FLOWPATH FROM NODE   2927.00 TO NODE     29.00 =  4158.00 FEET.
============================================================================
END OF STUDY SUMMARY:
TOTAL AREA(ACRES)      =    143.86  TC(MIN.) =     20.49
PEAK FLOW RATE(CFS)    =    226.26
============================================================================
============================================================================
END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR30-p

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
3006	3005	2	1,615.0	1,580.0	76.1	0.35	0.17	
3005	3004	5	1,580.0	1,360.0	465.9			
3005	3004	8				0.35	2.06	
3004	3003	5	1,360.0	1,210.0	558.5			
3004	3003	8				0.40	9.02	
3003	3002	5	1,210.0	1,080.0	596.6			
3003	3002	8				0.40	21.04	
3002	3001	5	1,080.0	870.0	870.8			
3002	3001	8				0.40	21.39	
3001	30	5	870.0	665.0	1,720.8			
3001	30	8				0.40	54.15	
							107.83	Total Area

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

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2004 Advanced Engineering Software (aes)
              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

                        FUSCOE ENGINEERING - SAN DIEGO, INC
                          6390 GREENWICH DRIVE, SUITE 170
                            SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 30                                                           *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MERR30-P.DAT
  TIME/DATE OF STUDY: 15:38 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   3006.00 TO NODE   3005.00 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) =    76.06
  UPSTREAM ELEVATION(FEET) =   1615.00
  DOWNSTREAM ELEVATION(FEET) =   1580.00
  ELEVATION DIFFERENCE(FEET) =     35.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.465
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.707
 SUBAREA RUNOFF(CFS) =      0.52
 TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      0.52

****************************************************************************
 FLOW PROCESS FROM NODE   3005.00 TO NODE   3004.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1580.00  DOWNSTREAM(FEET) =   1360.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   465.90   CHANNEL SLOPE =  0.4722
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2222 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.52
 FLOW VELOCITY(FEET/SEC) =   2.64 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.94   Tc(MIN.) =   8.41
 LONGEST FLOWPATH FROM NODE   3006.00 TO NODE   3004.00 =   541.96 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3005.00 TO NODE   3004.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.596
 *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) =     2.06   SUBAREA RUNOFF(CFS) =     4.76
 TOTAL AREA(ACRES) =      2.23   TOTAL RUNOFF(CFS) =     5.15
 TC(MIN.) =   8.41

****************************************************************************
 FLOW PROCESS FROM NODE   3004.00 TO NODE   3003.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1360.00  DOWNSTREAM(FEET) =   1210.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   558.50   CHANNEL SLOPE =  0.2686
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1862 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      5.15
 FLOW VELOCITY(FEET/SEC) =   4.17 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.23   Tc(MIN.) =  10.64
 LONGEST FLOWPATH FROM NODE   3006.00 TO NODE   3003.00 =  1100.46 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3004.00 TO NODE   3003.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.666
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3901
 SUBAREA AREA(ACRES) =     9.02   SUBAREA RUNOFF(CFS) =    20.44
 TOTAL AREA(ACRES) =     11.25   TOTAL RUNOFF(CFS) =    24.87
 TC(MIN.) =  10.64
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    3003.00 TO NODE    3002.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1210.00  DOWNSTREAM(FEET) =   1080.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   596.60   CHANNEL SLOPE =  0.2179
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1690 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     24.87
  FLOW VELOCITY(FEET/SEC) =   6.71 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.48   Tc(MIN.) =  12.12
  LONGEST FLOWPATH FROM NODE   3006.00 TO NODE   3002.00 =  1697.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    3003.00 TO NODE    3002.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.209
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3965
  SUBAREA AREA(ACRES) =   21.04   SUBAREA RUNOFF(CFS) =   43.84
  TOTAL AREA(ACRES) =     32.29   TOTAL RUNOFF(CFS) =   66.70
  TC(MIN.) =  12.12

****************************************************************************
  FLOW PROCESS FROM NODE    3002.00 TO NODE    2001.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1080.00  DOWNSTREAM(FEET) =    870.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   870.80   CHANNEL SLOPE =  0.2412
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1771 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     66.70
  FLOW VELOCITY(FEET/SEC) =   9.54 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.52   Tc(MIN.) =  13.64
  LONGEST FLOWPATH FROM NODE   3006.00 TO NODE   2001.00 =  2567.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    3002.00 TO NODE    3001.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.827
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3979
  SUBAREA AREA(ACRES) =   21.39   SUBAREA RUNOFF(CFS) =   41.30
  TOTAL AREA(ACRES) =     53.68   TOTAL RUNOFF(CFS) =  103.10
  TC(MIN.) =  13.64

****************************************************************************
  FLOW PROCESS FROM NODE    3001.00 TO NODE      30.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    870.00  DOWNSTREAM(FEET) =    665.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1720.80   CHANNEL SLOPE =  0.1191
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1143 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    103.10
  FLOW VELOCITY(FEET/SEC) =   8.87 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.23   Tc(MIN.) =  16.88
  LONGEST FLOWPATH FROM NODE   3006.00 TO NODE     30.00 =  4288.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3001.00 TO NODE     30.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.208
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3990
  SUBAREA AREA(ACRES) =   54.15   SUBAREA RUNOFF(CFS) =   91.14
  TOTAL AREA(ACRES) =    107.83   TOTAL RUNOFF(CFS) =  181.02
  TC(MIN.) =  16.88
==============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =    107.83  TC(MIN.) =     16.88
  PEAK FLOW RATE(CFS)    =    181.02
==============================================================================
==============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR31-p

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
3103	3102	2	1,335.0	1,300.0	82.0	0.35	0.47	
3102	3101	5	1,300.0	1,035.0	594.0			
3102	3101	8				0.46	5.56	
3101	31	5	1,035.0	650.0	1,825.0			
3101	31	8				0.46	31.91	
							37.94	Total Area

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

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2004 Advanced Engineering Software (aes)
              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

                        FUSCOE ENGINEERING - SAN DIEGO, INC
                          6390 GREENWICH DRIVE, SUITE 170
                            SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 31                                                           *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MERR31-P.DAT
  TIME/DATE OF STUDY: 15:39 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   3103.00 TO NODE   3102.00 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) =    82.00
  UPSTREAM ELEVATION(FEET) =   1335.00
  DOWNSTREAM ELEVATION(FEET) =   1300.00
  ELEVATION DIFFERENCE(FEET) =     35.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.675
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.499
SUBAREA RUNOFF(CFS) =      1.40
TOTAL AREA(ACRES) =      0.47   TOTAL RUNOFF(CFS) =      1.40

****************************************************************************
 FLOW PROCESS FROM NODE   3102.00 TO NODE   3101.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1300.00  DOWNSTREAM(FEET) =   1035.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   594.00   CHANNEL SLOPE =  0.4461
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2195 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      1.40
 FLOW VELOCITY(FEET/SEC) =   2.93 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.37   Tc(MIN.) =   9.05
 LONGEST FLOWPATH FROM NODE   3103.00 TO NODE   3101.00 =   676.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3102.00 TO NODE   3101.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.290
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4514
 SUBAREA AREA(ACRES) =     5.56   SUBAREA RUNOFF(CFS) =   16.09
 TOTAL AREA(ACRES) =      6.03   TOTAL RUNOFF(CFS) =   17.12
 TC(MIN.) =   9.05

****************************************************************************
 FLOW PROCESS FROM NODE   3101.00 TO NODE     31.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1035.00  DOWNSTREAM(FEET) =    650.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1825.00   CHANNEL SLOPE =  0.2110
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1655 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     17.12
 FLOW VELOCITY(FEET/SEC) =   5.87 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   5.19   Tc(MIN.) =  14.23
 LONGEST FLOWPATH FROM NODE   3103.00 TO NODE     31.00 =  2501.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3101.00 TO NODE     31.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.696
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4586
 SUBAREA AREA(ACRES) =   31.91   SUBAREA RUNOFF(CFS) =   68.93
 TOTAL AREA(ACRES) =     37.94   TOTAL RUNOFF(CFS) =   81.71
 TC(MIN.) =  14.23
============================================================================
 END OF STUDY SUMMARY:
```

```
  TOTAL AREA(ACRES)      =     37.94  TC(MIN.) =     14.23
  PEAK FLOW RATE(CFS)    =     81.71
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS

```

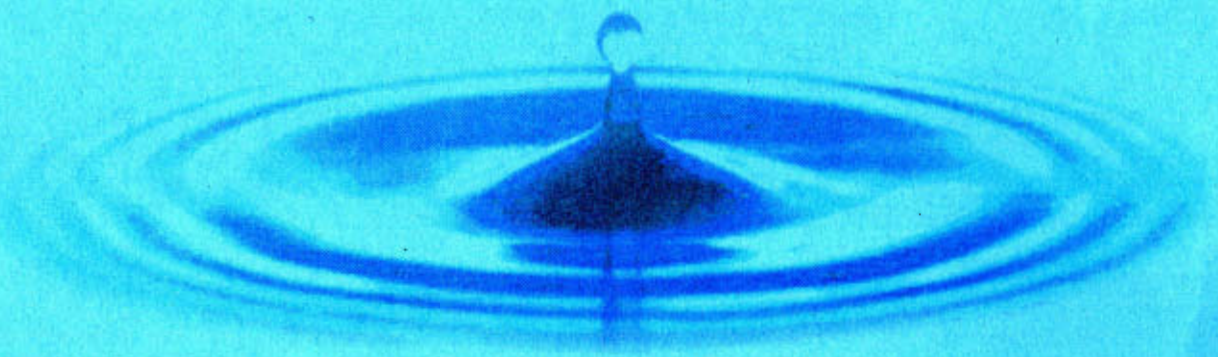
APPENDIX A

AES - 2005

Rational Method Hydrology

Proposed Condition

BASIN E



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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR32-P

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
3215	3214	2	1,450.0	1,445.0	75.0	0.35	0.25	
3214	3213	5	1,445.0	1,415.0	300.0			
3214	3213	8				0.35	15.25	
3213	3212	5	1,415.0	1,360.0	600.0			
3213	3212	8				0.35	12.04	
3212	3209	5	1,343.0	1,237.0	606.5			
3212	3209	8				0.35	11.05	
3209	3209	1						1 of 2
3211	3210	2	1,612.0	1,580.0	136.8	0.35	0.2	
3210	3209	5	1,580.0	1,237.0	1,282.0			
3210	3209	8				0.35	9.72	
3209	3209	1						2 of 2
3209	3208	5	1,237.0	1,020.0	807.7			
3209	3208	8				0.35	12.33	
3208	3204	5	1,020.0	931.0	1,048.9			
3208	3204	8				0.46	13.59	
3204	3204	1						1 of 2
3207	3206	2	1,347.0	1,335.0	93.0	0.35	0.29	
3206	3205	5	1,335.0	1,063.0	1,106.8			
3206	3205	8				0.35	15.11	
3205	3204	5	1,063.0	831.0	830.9			
3205	3204	8				0.46	12.79	
3204	3204	1						2 of 2
3204	3203	5	831.0	759.0	426.8			
3204	3203	8				0.46	5.34	
3203	32	5	759.0	724.0	430.0			
3203	32	8				0.46	14.09	
32	32	1						1 of 2
3202	3201	2	993.0	968.0	113.0	0.46	0.27	
3201	32	5	968.0	724.0	1,301.8			
3201	32	8				0.46	13.92	
32	32	1						2 of 2
							136.24	Total Area

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

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
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              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

                        FUSCOE ENGINEERING - SAN DIEGO, INC.
                          6390 GREENWICH DRIVE, SUITE 170
                            SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 32                                                           *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MERR32-P.DAT
  TIME/DATE OF STUDY: 13:53 10/10/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   3203.00 TO NODE   3202.80 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) =    75.00
  UPSTREAM ELEVATION(FEET) =   1450.00
  DOWNSTREAM ELEVATION(FEET) =   1445.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.212
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.017
```

```
 SUBAREA RUNOFF(CFS) =      0.70
 TOTAL AREA(ACRES) =      0.25   TOTAL RUNOFF(CFS) =      0.70

****************************************************************************
 FLOW PROCESS FROM NODE   3202.80 TO NODE   3202.60 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1445.00  DOWNSTREAM(FEET) =   1415.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.1000
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1000 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.70
 FLOW VELOCITY(FEET/SEC) =   1.77 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.82   Tc(MIN.) =   9.04
 LONGEST FLOWPATH FROM NODE   3203.00 TO NODE   3202.60 =   375.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3202.80 TO NODE   3202.60 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.296
 *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) =   15.25   SUBAREA RUNOFF(CFS) =   33.60
 TOTAL AREA(ACRES) =     15.50   TOTAL RUNOFF(CFS) =   34.15
 TC(MIN.) =   9.04

****************************************************************************
 FLOW PROCESS FROM NODE   3202.60 TO NODE   3202.40 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1415.00  DOWNSTREAM(FEET) =   1360.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.0917
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0917 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     34.15
 FLOW VELOCITY(FEET/SEC) =   5.49 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.82   Tc(MIN.) =  10.86
 LONGEST FLOWPATH FROM NODE   3203.00 TO NODE   3202.40 =   975.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3202.60 TO NODE   3202.40 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.593
 *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) =   12.04   SUBAREA RUNOFF(CFS) =   23.57
 TOTAL AREA(ACRES) =     27.54   TOTAL RUNOFF(CFS) =   53.91
 TC(MIN.) =  10.86

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

```
 FLOW PROCESS FROM NODE   3212.00 TO NODE   3209.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1343.00  DOWNSTREAM(FEET) =   1237.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   606.50   CHANNEL SLOPE =  0.1748
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1474 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     53.91
 FLOW VELOCITY(FEET/SEC) =   8.11 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.25   Tc(MIN.) =  12.10
 LONGEST FLOWPATH FROM NODE   3203.00 TO NODE   3209.00 =  1581.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3212.00 TO NODE   3209.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.214
 *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) =   11.05   SUBAREA RUNOFF(CFS) =   20.17
 TOTAL AREA(ACRES) =     38.59   TOTAL RUNOFF(CFS) =   70.43
 TC(MIN.) =  12.10

****************************************************************************
 FLOW PROCESS FROM NODE   3209.00 TO NODE   3209.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  12.10
 RAINFALL INTENSITY(INCH/HR) =   5.21
 TOTAL STREAM AREA(ACRES) =    38.59
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     70.43

****************************************************************************
 FLOW PROCESS FROM NODE   3211.00 TO NODE   3210.00 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) =   136.80
 UPSTREAM ELEVATION(FEET) =   1612.00
 DOWNSTREAM ELEVATION(FEET) =   1580.00
 ELEVATION DIFFERENCE(FEET) =     32.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =   100.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
 SUBAREA RUNOFF(CFS) =      0.56
 TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      0.56

****************************************************************************
 FLOW PROCESS FROM NODE   3210.00 TO NODE   3209.00 IS CODE =  53
```

```
------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1580.00  DOWNSTREAM(FEET) =   1237.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1282.00   CHANNEL SLOPE =  0.2676
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1859 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.56
  FLOW VELOCITY(FEET/SEC) =   2.41 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   8.85   Tc(MIN.) =  15.12
  LONGEST FLOWPATH FROM NODE   3211.00 TO NODE   3209.00 =  1418.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3210.00 TO NODE   3209.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.517
  *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) =     9.72   SUBAREA RUNOFF(CFS) =   15.37
  TOTAL AREA(ACRES) =       9.92   TOTAL RUNOFF(CFS) =   15.68
  TC(MIN.) =  15.12

****************************************************************************
  FLOW PROCESS FROM NODE   3209.00 TO NODE   3209.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  15.12
  RAINFALL INTENSITY(INCH/HR) =   4.52
  TOTAL STREAM AREA(ACRES) =     9.92
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     15.68

  ** CONFLUENCE DATA **
  STREAM      RUNOFF       Tc       INTENSITY       AREA
  NUMBER       (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
      1        70.43    12.10         5.214         38.59
      2        15.68    15.12         4.517          9.92

  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        82.98    12.10         5.214
      2        76.70    15.12         4.517

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     82.98   Tc(MIN.) =   12.10
  TOTAL AREA(ACRES) =     48.51
  LONGEST FLOWPATH FROM NODE   3203.00 TO NODE   3209.00 =  1581.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3209.00 TO NODE   2508.00 IS CODE =  53
```

```
------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1237.00  DOWNSTREAM(FEET) =   1020.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   807.70   CHANNEL SLOPE =  0.2687
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1862 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     82.98
  FLOW VELOCITY(FEET/SEC) =  10.53 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.28   Tc(MIN.) =  13.38
  LONGEST FLOWPATH FROM NODE   3203.00 TO NODE   2508.00 =  2389.20 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3209.00 TO NODE   3208.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.887
  *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) =   12.33   SUBAREA RUNOFF(CFS) =   21.09
  TOTAL AREA(ACRES) =     60.84   TOTAL RUNOFF(CFS) =  104.07
  TC(MIN.) =  13.38

****************************************************************************
  FLOW PROCESS FROM NODE   3208.00 TO NODE   3204.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1020.00  DOWNSTREAM(FEET) =    831.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1048.90   CHANNEL SLOPE =  0.1802
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1501 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    104.07
  FLOW VELOCITY(FEET/SEC) =  10.19 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.72   Tc(MIN.) =  15.10
  LONGEST FLOWPATH FROM NODE   3203.00 TO NODE   3204.00 =  3438.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3208.00 TO NODE   3204.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.521
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3701
  SUBAREA AREA(ACRES) =   13.59   SUBAREA RUNOFF(CFS) =   28.26
  TOTAL AREA(ACRES) =     74.43   TOTAL RUNOFF(CFS) =  124.54
  TC(MIN.) =  15.10

****************************************************************************
  FLOW PROCESS FROM NODE   3204.00 TO NODE   3204.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =  15.10
  RAINFALL INTENSITY(INCH/HR) =   4.52
  TOTAL STREAM AREA(ACRES) =    74.43
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    124.54

****************************************************************************
  FLOW PROCESS FROM NODE   3207.00 TO NODE   3206.00 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) =    93.00
  UPSTREAM ELEVATION(FEET) =   1347.00
  DOWNSTREAM ELEVATION(FEET) =   1335.00
  ELEVATION DIFFERENCE(FEET) =     12.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.043
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.161
  SUBAREA RUNOFF(CFS) =      0.83
  TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      0.83

****************************************************************************
  FLOW PROCESS FROM NODE   3206.00 TO NODE   3205.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1335.00  DOWNSTREAM(FEET) =   1063.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1106.80   CHANNEL SLOPE =  0.2458
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1786 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.83
  FLOW VELOCITY(FEET/SEC) =   2.37 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   7.79   Tc(MIN.) =  13.84
  LONGEST FLOWPATH FROM NODE   3207.00 TO NODE   3205.00 =  1199.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3206.00 TO NODE   3205.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.782
  *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) =   15.11   SUBAREA RUNOFF(CFS) =   25.29
  TOTAL AREA(ACRES) =     15.40   TOTAL RUNOFF(CFS) =   25.78
  TC(MIN.) =  13.84

****************************************************************************
  FLOW PROCESS FROM NODE   3205.00 TO NODE   3204.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1063.00  DOWNSTREAM(FEET) =    831.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   830.90   CHANNEL SLOPE =  0.2792
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1897 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
```

```
 CHANNEL FLOW THRU SUBAREA(CFS) =     25.78
 FLOW VELOCITY(FEET/SEC) =   7.20 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.92   Tc(MIN.) =  15.76
 LONGEST FLOWPATH FROM NODE   3207.00 TO NODE   3204.00 =  2030.70 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3205.00 TO NODE   3204.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.397
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3999
 SUBAREA AREA(ACRES) =   12.79   SUBAREA RUNOFF(CFS) =   25.87
 TOTAL AREA(ACRES) =     28.19   TOTAL RUNOFF(CFS) =   49.57
 TC(MIN.) =  15.76

****************************************************************************
 FLOW PROCESS FROM NODE   3204.00 TO NODE   3204.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  15.76
 RAINFALL INTENSITY(INCH/HR) =   4.40
 TOTAL STREAM AREA(ACRES) =    28.19
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     49.57

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY      AREA
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
     1       124.54     15.10        4.521         74.43
     2        49.57     15.76        4.397         28.19

 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       172.02     15.10        4.521
     2       170.70     15.76        4.397

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    172.02   Tc(MIN.) =   15.10
 TOTAL AREA(ACRES) =    102.62
 LONGEST FLOWPATH FROM NODE   3203.00 TO NODE   3204.00 =  3438.10 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3204.00 TO NODE   3203.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    831.00  DOWNSTREAM(FEET) =    759.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   426.80   CHANNEL SLOPE =  0.1687
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1443 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =    172.02
```

```
 FLOW VELOCITY(FEET/SEC) =  11.81 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   0.60   Tc(MIN.) =  15.70
 LONGEST FLOWPATH FROM NODE   3203.00 TO NODE   3203.00 =  3864.90 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3204.00 TO NODE   3203.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.409
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3823
 SUBAREA AREA(ACRES) =    5.34   SUBAREA RUNOFF(CFS) =   10.83
 TOTAL AREA(ACRES) =    107.96   TOTAL RUNOFF(CFS) =  181.97
 TC(MIN.) =  15.70

****************************************************************************
 FLOW PROCESS FROM NODE   3203.00 TO NODE     32.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    759.00  DOWNSTREAM(FEET) =    724.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   430.00   CHANNEL SLOPE =  0.0814
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0814 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =    181.97
 FLOW VELOCITY(FEET/SEC) =   9.04 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   0.79   Tc(MIN.) =  16.49
 LONGEST FLOWPATH FROM NODE   3203.00 TO NODE     32.00 =  4294.90 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3203.00 TO NODE     32.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.271
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3913
 SUBAREA AREA(ACRES) =   14.09   SUBAREA RUNOFF(CFS) =   27.68
 TOTAL AREA(ACRES) =    122.05   TOTAL RUNOFF(CFS) =  203.95
 TC(MIN.) =  16.49

****************************************************************************
 FLOW PROCESS FROM NODE     32.00 TO NODE     32.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  16.49
 RAINFALL INTENSITY(INCH/HR) =   4.27
 TOTAL STREAM AREA(ACRES) =   122.05
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    203.95

****************************************************************************
 FLOW PROCESS FROM NODE   3202.00 TO NODE   3201.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
==============================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   113.00
  UPSTREAM ELEVATION(FEET) =    993.00
  DOWNSTREAM ELEVATION(FEET) =    968.00
  ELEVATION DIFFERENCE(FEET) =     25.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.348
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =   100.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.830
  SUBAREA RUNOFF(CFS) =      1.10
  TOTAL AREA(ACRES) =      0.27   TOTAL RUNOFF(CFS) =      1.10

****************************************************************************
  FLOW PROCESS FROM NODE   3201.00 TO NODE     32.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    968.00  DOWNSTREAM(FEET) =    724.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1301.84   CHANNEL SLOPE =  0.1874
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1537 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      1.10
  FLOW VELOCITY(FEET/SEC) =   2.26 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   9.58   Tc(MIN.) =  14.93
  LONGEST FLOWPATH FROM NODE   3202.00 TO NODE     32.00 =  1414.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3201.00 TO NODE     32.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.554
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4600
  SUBAREA AREA(ACRES) =   13.92   SUBAREA RUNOFF(CFS) =   29.16
  TOTAL AREA(ACRES) =     14.19   TOTAL RUNOFF(CFS) =   29.72
  TC(MIN.) =  14.93

****************************************************************************
  FLOW PROCESS FROM NODE     32.00 TO NODE     32.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  14.93
  RAINFALL INTENSITY(INCH/HR) =   4.55
  TOTAL STREAM AREA(ACRES) =    14.19
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     29.72

  ** CONFLUENCE DATA **
  STREAM      RUNOFF       Tc       INTENSITY       AREA
  NUMBER       (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
      1       203.95    16.49         4.271         122.05
```

```
    2       29.72    14.93        4.554         14.19

  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       221.01    14.93        4.554
      2       231.83    16.49        4.271

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    231.83   Tc(MIN.) =   16.49
  TOTAL AREA(ACRES) =    136.24
  LONGEST FLOWPATH FROM NODE   3203.00 TO NODE     32.00 =  4294.90 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =    136.24  TC(MIN.) =     16.49
  PEAK FLOW RATE(CFS)    =    231.83
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR33-p

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
3302	3301.8	2	1,155.0	1,065.0	75.0	0.35	0.54	
3301.8	3301.6	5	1,065.0	945.0	375.0			
3301.8	3301.6	8				0.35	2.73	
3301.6	3301	5	945.0	810.0	415.0			
3301.6	3301	8				0.46	5.97	
3301	33	5	810.0	725.0	925.0			
3301	33	8				0.46	26.36	
							35.6	Total Area

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

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            Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                          Analysis prepared by:

                     FUSCOE ENGINEERING - SAN DIEGO, INC
                       6390 GREENWICH DRIVE, SUITE 170
                         SAN DIEGO, CALIFORNIA 92122
                              (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 33                                                           *
* 2469.01A - OCTOBER 2006                                                 *
 *************************************************************************

  FILE NAME: MERR33-P.DAT
  TIME/DATE OF STUDY: 15:43 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   3302.00 TO NODE   3301.80 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) =    75.00
  UPSTREAM ELEVATION(FEET) =   1155.00
  DOWNSTREAM ELEVATION(FEET) =   1065.00
  ELEVATION DIFFERENCE(FEET) =     90.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
SUBAREA RUNOFF(CFS) =      1.65
TOTAL AREA(ACRES) =      0.54   TOTAL RUNOFF(CFS) =      1.65

****************************************************************************
FLOW PROCESS FROM NODE   3301.80 TO NODE   3301.60 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1065.00  DOWNSTREAM(FEET) =    945.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   375.00   CHANNEL SLOPE =  0.3200
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .2000 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) =      1.65
FLOW VELOCITY(FEET/SEC) =   2.96 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   2.11   Tc(MIN.) =   7.54
LONGEST FLOWPATH FROM NODE   3302.00 TO NODE   3301.60 =   450.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   3301.80 TO NODE   3301.60 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.076
*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) =     2.73   SUBAREA RUNOFF(CFS) =     6.76
TOTAL AREA(ACRES) =       3.27   TOTAL RUNOFF(CFS) =     8.10
TC(MIN.) =   7.54

****************************************************************************
FLOW PROCESS FROM NODE   3301.60 TO NODE   3301.00 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    945.00  DOWNSTREAM(FEET) =    810.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   415.00   CHANNEL SLOPE =  0.3253
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .2009 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) =      8.10
FLOW VELOCITY(FEET/SEC) =   5.04 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   1.37   Tc(MIN.) =   8.91
LONGEST FLOWPATH FROM NODE   3302.00 TO NODE   3301.00 =   865.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   3301.60 TO NODE   3301.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.352
*USER SPECIFIED(SUBAREA):
RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.4211
SUBAREA AREA(ACRES) =     5.97   SUBAREA RUNOFF(CFS) =    17.44
TOTAL AREA(ACRES) =       9.24   TOTAL RUNOFF(CFS) =    24.72
TC(MIN.) =   8.91

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

```
 FLOW PROCESS FROM NODE    3301.00 TO NODE      33.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    810.00  DOWNSTREAM(FEET) =    725.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   925.00   CHANNEL SLOPE =  0.0919
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0919 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     24.72
 FLOW VELOCITY(FEET/SEC) =   4.94 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.12   Tc(MIN.) =  12.03
 LONGEST FLOWPATH FROM NODE   3302.00 TO NODE     33.00 =  1790.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    3301.00 TO NODE      33.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.234
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4499
 SUBAREA AREA(ACRES) =   26.36   SUBAREA RUNOFF(CFS) =   63.46
 TOTAL AREA(ACRES) =     35.60   TOTAL RUNOFF(CFS) =   83.83
 TC(MIN.) =  12.03
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =     35.60  TC(MIN.) =     12.03
 PEAK FLOW RATE(CFS)    =     83.83
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR34-p

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
3403	3402.8	2	1,575.0	1,520.0	75.0	0.35	0.29	
3402.8	3402.6	5	1,520.0	1,440.0	250.0			
3402.8	3402.6	8				0.35	1.3	
3402.6	3402	5	1,440.0	1,330.0	655.0			
3402.6	3402	8				0.35	14.27	
3402	3401	5	1,330.0	890.0	1,965.0			
3402	3401	8				0.35	71.31	
3401	34	5	890.0	805.0	525.0			
3401	34	8				0.46	10.38	
							97.55	Total Area

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

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                          Analysis prepared by:

                    FUSCOE ENGINEERING - SAN DIEGO, INC
                      6390 GREENWICH DRIVE, SUITE 170
                        SAN DIEGO, CALIFORNIA 92122
                             (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 34                                                           *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MERR34-P.DAT
  TIME/DATE OF STUDY: 15:45 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =    3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   3403.00 TO NODE   3402.80 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) =    75.00
  UPSTREAM ELEVATION(FEET) =   1575.00
  DOWNSTREAM ELEVATION(FEET) =   1520.00
  ELEVATION DIFFERENCE(FEET) =     55.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
SUBAREA RUNOFF(CFS) =      0.89
TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      0.89

****************************************************************************
 FLOW PROCESS FROM NODE   3402.80 TO NODE   3402.60 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1520.00  DOWNSTREAM(FEET) =   1440.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   250.00   CHANNEL SLOPE =  0.3200
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2000 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.89
 FLOW VELOCITY(FEET/SEC) =   2.50 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.66   Tc(MIN.) =   7.09
 LONGEST FLOWPATH FROM NODE   3403.00 TO NODE   3402.60 =   325.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3402.80 TO NODE   3402.60 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.361
 *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) =     1.30   SUBAREA RUNOFF(CFS) =     3.35
 TOTAL AREA(ACRES) =      1.59   TOTAL RUNOFF(CFS) =     4.10
 TC(MIN.) =   7.09

****************************************************************************
 FLOW PROCESS FROM NODE   3402.60 TO NODE   3402.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1440.00  DOWNSTREAM(FEET) =   1330.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   655.00   CHANNEL SLOPE =  0.1679
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1440 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      4.10
 FLOW VELOCITY(FEET/SEC) =   3.40 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.21   Tc(MIN.) =  10.30
 LONGEST FLOWPATH FROM NODE   3403.00 TO NODE   3402.00 =   980.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3402.60 TO NODE   3402.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.785
 *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) =    14.27   SUBAREA RUNOFF(CFS) =    28.89
 TOTAL AREA(ACRES) =     15.86   TOTAL RUNOFF(CFS) =    32.11
 TC(MIN.) =  10.30
```

```
**************************************************************************
 FLOW PROCESS FROM NODE   3402.00 TO NODE   3401.00 IS CODE =  53
--------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1330.00  DOWNSTREAM(FEET) =    890.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1965.00   CHANNEL SLOPE =  0.2239
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1713 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     32.11
 FLOW VELOCITY(FEET/SEC) =   7.36 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   4.45   Tc(MIN.) =  14.75
 LONGEST FLOWPATH FROM NODE   3403.00 TO NODE   3401.00 =  2945.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE   3402.00 TO NODE   3401.00 IS CODE =  81
--------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.589
 *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) =   71.31   SUBAREA RUNOFF(CFS) =  114.53
 TOTAL AREA(ACRES) =     87.17   TOTAL RUNOFF(CFS) =  140.00
 TC(MIN.) =  14.75

**************************************************************************
 FLOW PROCESS FROM NODE   3401.00 TO NODE     34.00 IS CODE =  53
--------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    890.00  DOWNSTREAM(FEET) =    805.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   525.00   CHANNEL SLOPE =  0.1619
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1410 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =    140.00
 FLOW VELOCITY(FEET/SEC) =  10.90 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   0.80   Tc(MIN.) =  15.56
 LONGEST FLOWPATH FROM NODE   3403.00 TO NODE     34.00 =  3470.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE   3401.00 TO NODE     34.00 IS CODE =  81
--------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.435
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3617
 SUBAREA AREA(ACRES) =   10.38   SUBAREA RUNOFF(CFS) =   21.17
 TOTAL AREA(ACRES) =     97.55   TOTAL RUNOFF(CFS) =  156.47
 TC(MIN.) =  15.56
==========================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =     97.55  TC(MIN.) =     15.56
 PEAK FLOW RATE(CFS)    =    156.47
==========================================================================
==========================================================================
```

END OF RATIONAL METHOD ANALYSIS

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tel 858.554.1500 ◦ fax 858.597.0335
www.fuscoe.com

Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR35-p

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
3502	3501.8	2	1,150.0	1,085.0	75.0	0.35	0.43	
3501.8	3501.6	5	1,085.0	1,035.0	300.0			
3501.8	3501.6	8				0.35	2.65	
3501.6	3501	5	1,035.0	905.0	540.0			
3501.6	3501	8				0.46	6.62	
3501	35	5	905.0	810.0	1,300.0			
3501	35	8				0.44	37.33	
							47.03	Total Area

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

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                          Analysis prepared by:

                    FUSCOE ENGINEERING - SAN DIEGO, INC.
                      6390 GREENWICH DRIVE, SUITE 170
                        SAN DIEGO, CALIFORNIA 92122
                             (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 35                                                           *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MERR35-P.DAT
  TIME/DATE OF STUDY: 11:46 10/06/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   3502.00 TO NODE   3501.80 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) =    75.00
  UPSTREAM ELEVATION(FEET) =   1150.00
  DOWNSTREAM ELEVATION(FEET) =   1085.00
  ELEVATION DIFFERENCE(FEET) =     65.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
SUBAREA RUNOFF(CFS) =      1.32
TOTAL AREA(ACRES) =      0.43   TOTAL RUNOFF(CFS) =      1.32

****************************************************************************
 FLOW PROCESS FROM NODE   3501.80 TO NODE   3501.60 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1085.00  DOWNSTREAM(FEET) =   1035.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.1667
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1433 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      1.32
 FLOW VELOCITY(FEET/SEC) =   2.32 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.15   Tc(MIN.) =   7.58
 LONGEST FLOWPATH FROM NODE   3502.00 TO NODE   3501.60 =   375.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3501.80 TO NODE   3501.60 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.052
 *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) =     2.65   SUBAREA RUNOFF(CFS) =    6.54
 TOTAL AREA(ACRES) =       3.08   TOTAL RUNOFF(CFS) =    7.60
 TC(MIN.) =   7.58

****************************************************************************
 FLOW PROCESS FROM NODE   3501.60 TO NODE   3501.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1035.00  DOWNSTREAM(FEET) =    905.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   540.00   CHANNEL SLOPE =  0.2407
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1769 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      7.60
 FLOW VELOCITY(FEET/SEC) =   4.63 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.94   Tc(MIN.) =   9.52
 LONGEST FLOWPATH FROM NODE   3502.00 TO NODE   3501.00 =   915.00 FEET.

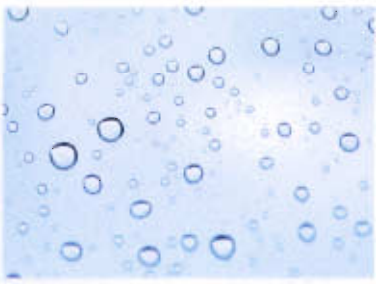
****************************************************************************
 FLOW PROCESS FROM NODE   3501.60 TO NODE   3501.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.086
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4251
 SUBAREA AREA(ACRES) =     6.62   SUBAREA RUNOFF(CFS) =   18.53
 TOTAL AREA(ACRES) =       9.70   TOTAL RUNOFF(CFS) =   25.09
 TC(MIN.) =   9.52

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

```
 FLOW PROCESS FROM NODE    3501.00 TO NODE      35.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     905.00  DOWNSTREAM(FEET) =     810.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1300.00   CHANNEL SLOPE =  0.0731
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0731 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      25.09
 FLOW VELOCITY(FEET/SEC) =   4.43 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   4.89   Tc(MIN.) =  14.42
 LONGEST FLOWPATH FROM NODE   3502.00 TO NODE      35.00 =  2215.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    3501.00 TO NODE      35.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.657
 *USER SPECIFIED(SUBAREA):
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4400
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4369
 SUBAREA AREA(ACRES) =    37.33   SUBAREA RUNOFF(CFS) =   76.50
 TOTAL AREA(ACRES) =      47.03   TOTAL RUNOFF(CFS) =   95.70
 TC(MIN.) =  14.42
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =      47.03  TC(MIN.) =      14.42
 PEAK FLOW RATE(CFS)    =      95.70
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

HYDROLOGY/HYDRAULIC REPORT:



Merriam Mountains, TM5381
Env. Log #04-08-028
Volume 3 - March 2007

Prepared For: Stonegate Merriam LLC

Prepared By: Erik K. Armstrong

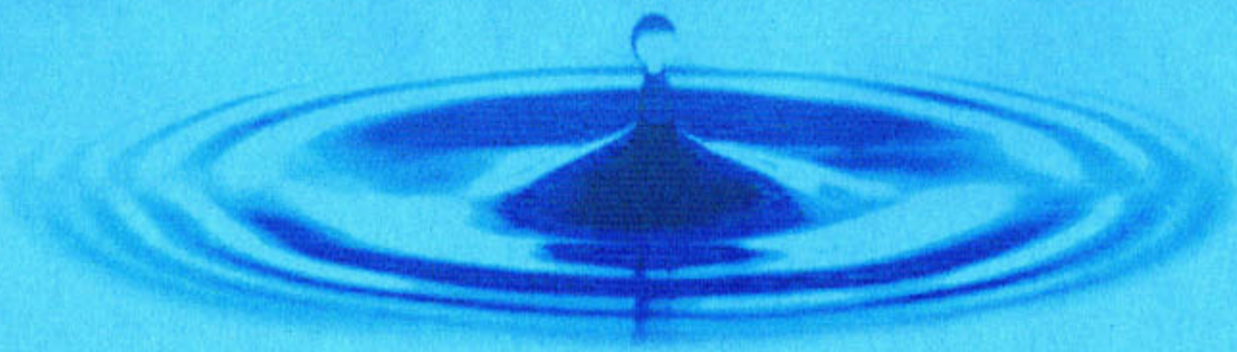
Job Number: 2469.01A

FUSCOE ENGINEERING

APPENDIX B

Existing Detention Storage Analysis

SUB-BASIN 1



FUSCOE
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www.fuscoe.com

Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR01

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
102	101.8	2	1,225.0	1,205.0	75.0	0.35	0.32	Initial Runoff
101.8	101.6	5	1,205.0	1,135.0	300.0			Channel Flow
101.8	101.6	8				0.35	2.16	Add Area
101.6	101.4	5	1,135.0	1,020.0	600.0			
101.6	101.4	8				0.35	7.7	
101.4	101	5	1,020.0	860.0	740.0			
101.4	101	8				0.32	6.99	
101	100	5	860.0	575.0	1,640.0			
101	100	8				0.26	54.7	
100	1	4	555.4	504.8	444.0			Pipe flow
							71.87	Total Area

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

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2004 Advanced Engineering Software (aes)
              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

                       FUSCOE ENGINEERING - SAN DIEGO, INC.
                         6390 GREENWICH DRIVE, SUITE 170
                           SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                  *
* SUBBASIN 1 - NO DETENTION ROUTING                                       *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MERR01.DAT
  TIME/DATE OF STUDY: 08:56 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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    102.00 TO NODE    101.80 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) =    75.00
  UPSTREAM ELEVATION(FEET) =   1225.00
  DOWNSTREAM ELEVATION(FEET) =   1205.00
  ELEVATION DIFFERENCE(FEET) =     20.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
SUBAREA RUNOFF(CFS) =      0.98
TOTAL AREA(ACRES) =      0.32   TOTAL RUNOFF(CFS) =      0.98

****************************************************************************
 FLOW PROCESS FROM NODE    101.80 TO NODE    101.60 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1205.00  DOWNSTREAM(FEET) =   1135.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.2333
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1744 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.98
 FLOW VELOCITY(FEET/SEC) =   2.34 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.14   Tc(MIN.) =   7.56
 LONGEST FLOWPATH FROM NODE    102.00 TO NODE    101.60 =   375.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    101.80 TO NODE    101.60 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.060
 *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) =     2.16   SUBAREA RUNOFF(CFS) =     5.34
 TOTAL AREA(ACRES) =      2.48   TOTAL RUNOFF(CFS) =    6.13
 TC(MIN.) =   7.56

****************************************************************************
 FLOW PROCESS FROM NODE    101.60 TO NODE    101.40 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1135.00  DOWNSTREAM(FEET) =   1020.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.1917
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1558 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      6.13
 FLOW VELOCITY(FEET/SEC) =   4.04 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.47   Tc(MIN.) =  10.04
 LONGEST FLOWPATH FROM NODE    102.00 TO NODE    101.40 =   975.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    101.60 TO NODE    101.40 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.883
 *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) =     7.70   SUBAREA RUNOFF(CFS) =    15.85
 TOTAL AREA(ACRES) =     10.18   TOTAL RUNOFF(CFS) =   20.96
 TC(MIN.) =  10.04
```

```
**************************************************************************
 FLOW PROCESS FROM NODE    101.40 TO NODE    101.00 IS CODE =  53
--------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1020.00  DOWNSTREAM(FEET) =    860.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   740.00   CHANNEL SLOPE =  0.2162
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1681 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     20.96
 FLOW VELOCITY(FEET/SEC) =   6.32 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.95   Tc(MIN.) =  11.99
 LONGEST FLOWPATH FROM NODE    102.00 TO NODE    101.00 =  1715.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE    101.40 TO NODE    101.00 IS CODE =  81
--------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.246
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3200
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3378
 SUBAREA AREA(ACRES) =    6.99   SUBAREA RUNOFF(CFS) =   11.73
 TOTAL AREA(ACRES) =     17.17   TOTAL RUNOFF(CFS) =   30.43
 TC(MIN.) =  11.99

**************************************************************************
 FLOW PROCESS FROM NODE    101.00 TO NODE    100.00 IS CODE =  53
--------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    860.00  DOWNSTREAM(FEET) =    575.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1640.00   CHANNEL SLOPE =  0.1738
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1469 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     30.43
 FLOW VELOCITY(FEET/SEC) =   6.69 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   4.08   Tc(MIN.) =  16.07
 LONGEST FLOWPATH FROM NODE    102.00 TO NODE    100.00 =  3355.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE    101.00 TO NODE    100.00 IS CODE =  81
--------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.342
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2786
 SUBAREA AREA(ACRES) =   54.70   SUBAREA RUNOFF(CFS) =   61.76
 TOTAL AREA(ACRES) =     71.87   TOTAL RUNOFF(CFS) =   86.94
 TC(MIN.) =  16.07

**************************************************************************
 FLOW PROCESS FROM NODE    100.00 TO NODE      1.00 IS CODE =  41
--------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   555.40  DOWNSTREAM(FEET) =   504.80
  FLOW LENGTH(FEET) =   444.00   MANNING'S N =  0.024
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  19.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.06
  GIVEN PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     86.94
  PIPE TRAVEL TIME(MIN.) =   0.41    Tc(MIN.) =  16.48
  LONGEST FLOWPATH FROM NODE    102.00 TO NODE      1.00 =  3799.00 FEET.
==============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     71.87  TC(MIN.) =     16.48
  PEAK FLOW RATE(CFS)   =     86.94
==============================================================================
==============================================================================
  END OF RATIONAL METHOD ANALYSIS

```

RATIONAL METHOD HYDROGRAPH PROGRAM
COPYRIGHT 1992, 2001 RICK ENGINEERING COMPANY

RUN DATE 9/28/2006
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 16 MIN.
6 H` `RAINFALL 3.5 INCHES
BA .REA 71.87 ACRES
RUNOFF COEFFICIENT 0.28
PEAK DISCHARGE 86.94 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 16	DISCHARGE (CFS) = 4.2
TIME (MIN) = 32	DISCHARGE (CFS) = 4.4
TIME (MIN) = 48	DISCHARGE (CFS) = 4.6
TIME (MIN) = 64	DISCHARGE (CFS) = 4.9
TIME (MIN) = 80	DISCHARGE (CFS) = 5.1
TIME (MIN) = 96	DISCHARGE (CFS) = 5.5
TIME (MIN) = 112	DISCHARGE (CFS) = 5.8
TIME (MIN) = 128	DISCHARGE (CFS) = 6.4
TIME (MIN) = 144	DISCHARGE (CFS) = 6.8
TIME (MIN) = 160	DISCHARGE (CFS) = 7.8
TIME (MIN) = 176	DISCHARGE (CFS) = 8.5
TIME (MIN) = 192	DISCHARGE (CFS) = 10.4
TIME (MIN) = 208	DISCHARGE (CFS) = 11.8
TIME (MIN) = 224	DISCHARGE (CFS) = 17.4
TIME (MIN) = 240	DISCHARGE (CFS) = 25.1
TIME (MIN) = 256	DISCHARGE (CFS) = 86.94
TIME (MIN) = 272	DISCHARGE (CFS) = 13.9
TIME (MIN) = 288	DISCHARGE (CFS) = 9.3
TIME (MIN) = 304	DISCHARGE (CFS) = 7.3
TIME (MIN) = 320	DISCHARGE (CFS) = 6.1
TIME (MIN) = 336	DISCHARGE (CFS) = 5.3
TIME (MIN) = 352	DISCHARGE (CFS) = 4.7
TIME (MIN) = 368	DISCHARGE (CFS) = 4.3
TIME (MIN) = 384	DISCHARGE (CFS) = 0

```
**************************************************************************
                HYDRAULICS ELEMENTS - II  PROGRAM PACKAGE

                STORAGE BASIN HYDROGRAPH ROUTING MODEL
**************************************************************************
```

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Ver. 10.0 Release Date: 01/01/2004 License ID 1355

Analysis prepared by:

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SAN DIEGO, CALIFORNIA 92122
(858) 554-1500

********** DESCRIPTION OF STUDY **********

* MERRIAM MOUNTAINS - EXISTING HYDROLOGY
* SUBBASIN 1 - EXISTING DETENTION STORAGE ROUTING
* 2469.01A - OCTOBER 2006

****

FILE NAME: MMDET01.DAT
TIME/DATE OF STUDY: 10:33 09/28/2006

==========

ENTERED INFORMATION:

TOTAL NUMBER OF INFLOW HYDROGRAPH INTERVALS = 49
CONSTANT HYDROGRAPH TIME UNIT(MINUTES) = 8.000
ASSUMED INITIAL DEPTH(FEET) IN STORAGE BASIN = 0.00

ENTERED INFLOW HYDROGRAPH ORDINATES(CFS):

INTERVAL NUMBER	FLOW (CFS)	INTERVAL NUMBER	FLOW (CFS)	INTERVAL NUMBER	FLOW (CFS)
1:	0.00	2:	2.10	3:	4.20
4:	4.30	5:	4.40	6:	4.50
7:	4.60	8:	4.80	9:	4.90
10:	5.00	11:	5.10	12:	5.30
13:	5.50	14:	5.70	15:	5.80
16:	6.10	17:	6.40	18:	6.60
19:	6.80	20:	7.30	21:	7.80
22:	8.20	23:	8.50	24:	9.50
25:	10.40	26:	11.10	27:	11.80
28:	14.60	29:	17.40	30:	21.30
31:	25.10	32:	56.00	33:	86.90
34:	50.40	35:	13.90	36:	11.60
37:	9.30	38:	8.30	39:	7.30
40:	6.70	41:	6.10	42:	5.70
43:	5.30	44:	5.00	45:	4.70
46:	4.50	47:	4.30	48:	2.20
49:	0.00				

==========

DEPTH-VS.-STORAGE AND DEPTH-VS.-DISCHARGE INFORMATION:

TOTAL NUMBER OF BASIN DEPTH INFORMATION ENTRIES = 6

BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS)	BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS)
0.000	0.000	0.000	2.000	0.210	26.000
3.000	0.320	50.000	4.000	0.420	72.000
5.000	0.525	90.000	10.000	1.900	140.000

****

INITIAL BASIN DEPTH(FEET) = 0.00
INITIAL BASIN STORAGE(ACRE-FEET) = 0.00
INITIAL BASIN OUTFLOW(CFS) = 0.00

BASIN STORAGE, OUTFLOW AND DEPTH ROUTING VALUES:

INTERVAL NUMBER	{S-O*DT/2} (ACRE-FEET)	{S+O*DT/2} (ACRE-FEET)
1	0.00000	0.00000
2	0.06675	0.35325
3	0.04452	0.59548
4	0.02331	0.81669
5	0.02913	1.02087
6	1.12865	2.67135

WHERE S=STORAGE(AF);O=OUTFLOW(AF/MIN.);DT=UNIT(MIN.)

UNIT-HYDROGRAPH STORAGE-BASIN ROUTING

NOTE: COMPUTED BASIN DEPTH, OUTFLOW, AND STORAGE QUANTITIES OCCUR AT THE GIVEN TIME. BASIN INFLOW VALUES REPRESENT THE AVERAGE INFLOW DURING THE RECENT HYDROGRAPH UNIT INTERVAL.

GRAPH NOTATION: "I"=MEAN UNIT INFLOW; "O"=OUTFLOW AT GIVEN TIME

TIME (HOURS)	INFLOW (CFS)	OUTFLOW (CFS)	STORAGE (ACRE-FT)	0. 22. 43. 65. 87.
0.13	0.00	0.00	0.000	O
[BASIN DEPTH(FEET) = 0.00]				
0.27	2.10	1.70	0.014	O
[BASIN DEPTH(FEET) = 0.13]				
0.40	4.20	3.73	0.030	.O
[BASIN DEPTH(FEET) = 0.29]				
0.53	4.30	4.19	0.034	.O
[BASIN DEPTH(FEET) = 0.32]				
0.67	4.40	4.36	0.035	.O
[BASIN DEPTH(FEET) = 0.34]				
0.80	4.50	4.47	0.036	.O
[BASIN DEPTH(FEET) = 0.34]				
0.93	4.60	4.58	0.037	.O
[BASIN DEPTH(FEET) = 0.35]				
1.07	4.80	4.76	0.038	.O
[BASIN DEPTH(FEET) = 0.37]				
1.20	4.90	4.87	0.039	.O
[BASIN DEPTH(FEET) = 0.37]				
1.33	5.00	4.98	0.040	.O
[BASIN DEPTH(FEET) = 0.38]				
1.47	5.10	5.08	0.041	.O
[BASIN DEPTH(FEET) = 0.39]				
1.60	5.30	5.26	0.042	.O
[BASIN DEPTH(FEET) = 0.40]				
1.73	5.50	5.45	0.044	. O
[BASIN DEPTH(FEET) = 0.42]				
1.87	5.70	5.65	0.046	. O
[BASIN DEPTH(FEET) = 0.43]				
2.00	5.80	5.77	0.047	. O
[BASIN DEPTH(FEET) = 0.44]				
2.13	6.10	6.04	0.049	. O
[BASIN DEPTH(FEET) = 0.46]				
2.27	6.40	6.33	0.051	. O

```
  [BASIN DEPTH(FEET) =    0.49]
2.40     6.60     6.55      0.053 . o     .       .       .       .
  [BASIN DEPTH(FEET) =    0.50]
2.53     6.80     6.75      0.055 . o     .       .       .       .
  [BASIN DEPTH(FEET) =    0.52]
2.67     7.30     7.20      0.058 . o     .       .       .       .
  [BASIN DEPTH(FEET) =    0.55]
2.80     7.80     7.69      0.062 . o     .       .       .       .
  [BASIN DEPTH(FEET) =    0.59]
2.93     8.20     8.10      0.065 . oI    .       .       .       .
  [BASIN DEPTH(FEET) =    0.62]
3.07     8.50     8.42      0.068 .  o    .       .       .       .
  [BASIN DEPTH(FEET) =    0.65]
3.20     9.50     9.30      0.075 .  o    .       .       .       .
  [BASIN DEPTH(FEET) =    0.72]
3.33    10.40    10.19      0.082 .  o    .       .       .       .
  [BASIN DEPTH(FEET) =    0.78]
3.47    11.10    10.93      0.088 .   o   .       .       .       .
  [BASIN DEPTH(FEET) =    0.84]
3.60    11.80    11.64      0.094 .   o   .       .       .       .
  [BASIN DEPTH(FEET) =    0.90]
3.73    14.60    14.04      0.113 .    o  .       .       .       .
  [BASIN DEPTH(FEET) =    1.08]
3.87    17.40    16.77      0.135 .     o .       .       .       .
  [BASIN DEPTH(FEET) =    1.29]
4.00    21.30    20.44      0.165 .      o.       .       .       .
  [BASIN DEPTH(FEET) =    1.57]
4.13    25.10    24.22      0.196 .       oI      .       .       .
  [BASIN DEPTH(FEET) =    1.86]
4.27    56.00    58.33      0.358 .       .       .   IO  .       .
  [BASIN DEPTH(FEET) =    3.38]
4.40    86.90    87.64      0.511 .       .       .       .       o
  [BASIN DEPTH(FEET) =    4.87]
4.53    50.40    48.84      0.315 .       .      .oI      .       .
  [BASIN DEPTH(FEET) =    2.95]
4.67    13.90    14.63      0.118 .    o  .       .       .       .
  [BASIN DEPTH(FEET) =    1.13]
4.80    11.60    12.17      0.098 .   o   .       .       .       .
  [BASIN DEPTH(FEET) =    0.94]
4.93     9.30     9.84      0.079 .  o    .       .       .       .
  [BASIN DEPTH(FEET) =    0.76]
5.07     8.30     8.59      0.069 .  o    .       .       .       .
  [BASIN DEPTH(FEET) =    0.66]
5.20     7.30     7.54      0.061 . o     .       .       .       .
  [BASIN DEPTH(FEET) =    0.58]
5.33     6.70     6.86      0.055 . o     .       .       .       .
  [BASIN DEPTH(FEET) =    0.53]
5.47     6.10     6.24      0.050 . o     .       .       .       .
  [BASIN DEPTH(FEET) =    0.48]
5.60     5.70     5.80      0.047 . o     .       .       .       .
  [BASIN DEPTH(FEET) =    0.45]
5.73     5.30     5.39      0.044 .o      .       .       .       .
  [BASIN DEPTH(FEET) =    0.41]
5.87     5.00     5.07      0.041 .o      .       .       .       .
  [BASIN DEPTH(FEET) =    0.39]
6.00     4.70     4.77      0.039 .o      .       .       .       .
  [BASIN DEPTH(FEET) =    0.37]
6.13     4.50     4.55      0.037 .o      .       .       .       .
  [BASIN DEPTH(FEET) =    0.35]
6.27     4.30     4.35      0.035 .o      .       .       .       .
  [BASIN DEPTH(FEET) =    0.33]
6.40     2.20     2.61      0.021 o       .       .       .       .
  [BASIN DEPTH(FEET) =    0.20]
```

```
6.53     0.00     0.49       0.004 O       .       .       .       .
  [BASIN DEPTH(FEET) =    0.04]
6.67     0.00     0.09       0.001 O       .       .       .       .
  [BASIN DEPTH(FEET) =    0.01]
6.80     0.00     0.02       0.000 O       .       .       .       .
  [BASIN DEPTH(FEET) =    0.00]
6.93     0.00     0.00       0.000 O       .       .       .       .
  [BASIN DEPTH(FEET) =    0.00]
7.07     0.00     0.00       0.000 O       .       .       .       .
  [BASIN DEPTH(FEET) =    0.00]
7.20     0.00     0.00       0.000 O       .       .       .       .
  [BASIN DEPTH(FEET) =    0.00]
7.33     0.00     0.00       0.000 O       .       .       .       .
  [BASIN DEPTH(FEET) =    0.00]
7.47     0.00     0.00       0.000 O       .       .       .       .
  [BASIN DEPTH(FEET) =    0.00]
7.60     0.00     0.00       0.000 O       .       .       .       .
  [BASIN DEPTH(FEET) =    0.00]
7.73     0.00     0.00       0.000 O       .       .       .       .
  [BASIN DEPTH(FEET) =    0.00]
7.87     0.00     0.00       0.000 O       .       .       .       .
  [BASIN DEPTH(FEET) =    0.00]
8.00     0.00     0.00       0.000 O       .       .       .       .
  [BASIN DEPTH(FEET) =    0.00]
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Job #:
2469.01A

Date:
October 2006

Run Name:
MERR01-P

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Land Use	Runoff Coeff.	Area (ac.)	Comments
114	113	2	1,225.0	1,205.0	80.0		0.45	0.32	Initial Runoff
113	112	5	1,205.0	1,127.0	292.0				Channel Flow
113	112	8					0.45	2.16	Add Area
112	111	5	1,127.0	1,024.0	685.0				
112	111	8					0.40	7.71	
111	110	5	1,024.0	795.0	908.0				
111	110	8					0.27	9.01	
110	103	5	795.0	700.0	570.0				
110	103	8					0.77	6.24	
103	103	1							1 of 2
108	107	2	1,150.0	1,115.0	110.0		0.35	0.23	
107	106	5	1,115.0	810.0	1,017.0				
107	106	8					0.31	9.24	
106	104	3	810.0	770.0	250.0				
105	104	8					0.27	6.68	
104	103	5	770.0	700.0	575.0				
104	103	8					0.77	8.26	
103	103	1							2 of 2
103	101	5	700.0	585.0	663.0				
103	101	8					0.25	8.59	
102	101	8					0.25	6.06	
101	100	5	585.0	570.0	220.0				
101	100	8					0.25	7.37	
100	1	4	555.4	504.8	561.0				EX. 48" CSP Caltrans
									Storm Drain
								71.87	Total Area

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

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                        2003,1985,1981 HYDROLOGY MANUAL
       (c) Copyright 1982-2004 Advanced Engineering Software (aes)
           Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                          Analysis prepared by:

                     FUSCOE ENGINEERING - SAN DIEGO, INC.
                       6390 GREENWICH DRIVE, SUITE 170
                         SAN DIEGO, CALIFORNIA 92122
                               (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 1 - NO DETENTION ROUTING                                     *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MERR01-P.DAT
  TIME/DATE OF STUDY: 09:30 09/29/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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    114.00 TO NODE    113.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1225.00
  DOWNSTREAM ELEVATION(FEET) =   1205.00
  ELEVATION DIFFERENCE(FEET) =     20.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.858
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) =      1.33
TOTAL AREA(ACRES) =      0.32   TOTAL RUNOFF(CFS) =      1.33

****************************************************************************
 FLOW PROCESS FROM NODE    113.00 TO NODE    112.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1205.00  DOWNSTREAM(FEET) =   1127.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   292.00   CHANNEL SLOPE =  0.2671
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1857 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      1.33
 FLOW VELOCITY(FEET/SEC) =   2.65 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.83   Tc(MIN.) =   6.69
 LONGEST FLOWPATH FROM NODE    114.00 TO NODE    112.00 =   372.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    113.00 TO NODE    112.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.641
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4500
 SUBAREA AREA(ACRES) =    2.16   SUBAREA RUNOFF(CFS) =    7.43
 TOTAL AREA(ACRES) =      2.48   TOTAL RUNOFF(CFS) =    8.53
 TC(MIN.) =   6.69

****************************************************************************
 FLOW PROCESS FROM NODE    112.00 TO NODE    111.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1127.00  DOWNSTREAM(FEET) =   1024.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   685.00   CHANNEL SLOPE =  0.1504
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1352 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      8.53
 FLOW VELOCITY(FEET/SEC) =   4.20 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.72   Tc(MIN.) =   9.41
 LONGEST FLOWPATH FROM NODE    114.00 TO NODE    111.00 =  1057.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    112.00 TO NODE    111.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.134
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .4000
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4122
 SUBAREA AREA(ACRES) =    7.71   SUBAREA RUNOFF(CFS) =   18.92
 TOTAL AREA(ACRES) =     10.19   TOTAL RUNOFF(CFS) =   25.76
 TC(MIN.) =   9.41
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    111.00 TO NODE    110.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1024.00  DOWNSTREAM(FEET) =    795.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   908.00   CHANNEL SLOPE =  0.2522
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1807 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     25.76
  FLOW VELOCITY(FEET/SEC) =   7.02 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.15   Tc(MIN.) =  11.56
  LONGEST FLOWPATH FROM NODE    114.00 TO NODE    110.00 =  1965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    111.00 TO NODE    110.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.370
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3455
  SUBAREA AREA(ACRES) =    9.01   SUBAREA RUNOFF(CFS) =   13.06
  TOTAL AREA(ACRES) =     19.20   TOTAL RUNOFF(CFS) =   35.62
  TC(MIN.) =  11.56

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    103.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    795.00  DOWNSTREAM(FEET) =    700.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   570.00   CHANNEL SLOPE =  0.1667
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1433 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     35.62
  FLOW VELOCITY(FEET/SEC) =   6.97 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.36   Tc(MIN.) =  12.93
  LONGEST FLOWPATH FROM NODE    114.00 TO NODE    103.00 =  2535.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    103.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.997
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4496
  SUBAREA AREA(ACRES) =    6.24   SUBAREA RUNOFF(CFS) =   24.01
  TOTAL AREA(ACRES) =     25.44   TOTAL RUNOFF(CFS) =   57.16
  TC(MIN.) =  12.93

****************************************************************************
  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.) =  12.93
 RAINFALL INTENSITY(INCH/HR) =   5.00
 TOTAL STREAM AREA(ACRES) =    25.44
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     57.16

****************************************************************************
 FLOW PROCESS FROM NODE    108.00 TO NODE    107.00 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) =   110.00
 UPSTREAM ELEVATION(FEET) =   1150.00
 DOWNSTREAM ELEVATION(FEET) =   1115.00
 ELEVATION DIFFERENCE(FEET) =     35.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =   100.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.972
 SUBAREA RUNOFF(CFS) =      0.64
 TOTAL AREA(ACRES) =      0.23   TOTAL RUNOFF(CFS) =      0.64

****************************************************************************
 FLOW PROCESS FROM NODE    107.00 TO NODE    106.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1115.00  DOWNSTREAM(FEET) =    810.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1017.00   CHANNEL SLOPE =  0.2999
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1950 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.64
 FLOW VELOCITY(FEET/SEC) =   2.47 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   6.85   Tc(MIN.) =  13.12
 LONGEST FLOWPATH FROM NODE    108.00 TO NODE    106.00 =  1127.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    107.00 TO NODE    106.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.949
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3100
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3110
 SUBAREA AREA(ACRES) =    9.24   SUBAREA RUNOFF(CFS) =   14.18
 TOTAL AREA(ACRES) =      9.47   TOTAL RUNOFF(CFS) =   14.58
 TC(MIN.) =  13.12

****************************************************************************
 FLOW PROCESS FROM NODE    106.00 TO NODE    104.00 IS CODE =  37
----------------------------------------------------------------------------
 >>>>>COMPUTE CULVERT TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED CULVERT SIZE<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   810.00  DOWNSTREAM(FEET) =   770.00
  FLOW LENGTH(FEET) =   250.00   MANNING'S N =  0.014
  Notes:
    1. Reference: "Hydraulic Charts for the Selection of
       Highway Culverts", Hydraulic Engineering Circular No. 5,
       December 1965, Federal Highway Administration.
    2. INLET control for all Culvert Analysis.
    3. Headwater depth is ASSUMED to be 3 FEET above the culvert soffit.
  ESTIMATED CONCRETE PIPE CULVERT DIAMETER(FEET) =   1.50
  NUMBER OF BARREL(S) =   1
  CULVERT-FLOW VELOCITY(FEET/SEC.) =   8.25
  CULVERT-FLOW(CFS) =     14.58
  CULVERT-FLOW TRAVEL TIME(MIN.) =   0.51    Tc(MIN.) =  13.63
  LONGEST FLOWPATH FROM NODE    108.00 TO NODE    104.00 =  1377.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    104.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.830
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2940
  SUBAREA AREA(ACRES) =    6.68   SUBAREA RUNOFF(CFS) =    8.71
  TOTAL AREA(ACRES) =     16.15   TOTAL RUNOFF(CFS) =   22.94
  TC(MIN.) =  13.63

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    103.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    770.00  DOWNSTREAM(FEET) =    700.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   575.00   CHANNEL SLOPE =  0.1217
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1162 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     22.94
  FLOW VELOCITY(FEET/SEC) =   5.42 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.77   Tc(MIN.) =  15.40
  LONGEST FLOWPATH FROM NODE    108.00 TO NODE    103.00 =  1952.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    103.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.464
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4551
  SUBAREA AREA(ACRES) =    8.26   SUBAREA RUNOFF(CFS) =   28.39
  TOTAL AREA(ACRES) =     24.41   TOTAL RUNOFF(CFS) =   49.59
  TC(MIN.) =  15.40

****************************************************************************
  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.) =  15.40
  RAINFALL INTENSITY(INCH/HR) =   4.46
  TOTAL STREAM AREA(ACRES) =    24.41
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     49.59

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY       AREA
  NUMBER      (CFS)     (MIN.)    (INCH/HOUR)     (ACRE)
      1       57.16     12.93         4.997         25.44
      2       49.59     15.40         4.464         24.41

  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       98.80     12.93         4.997
      2      100.66     15.40         4.464

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    100.66   Tc(MIN.) =   15.40
  TOTAL AREA(ACRES) =     49.85
  LONGEST FLOWPATH FROM NODE    114.00 TO NODE    103.00 =  2535.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    101.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    700.00  DOWNSTREAM(FEET) =    585.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   663.00   CHANNEL SLOPE =  0.1735
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1467 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    100.66
  FLOW VELOCITY(FEET/SEC) =   9.96 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.11   Tc(MIN.) =  16.50
  LONGEST FLOWPATH FROM NODE    114.00 TO NODE    101.00 =  3198.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    101.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.269
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4225
  SUBAREA AREA(ACRES) =    8.59   SUBAREA RUNOFF(CFS) =    9.17
  TOTAL AREA(ACRES) =     58.44   TOTAL RUNOFF(CFS) =  105.41
  TC(MIN.) =  16.50

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    101.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.269
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.4063
SUBAREA AREA(ACRES) =    6.06   SUBAREA RUNOFF(CFS) =    6.47
TOTAL AREA(ACRES) =     64.50   TOTAL RUNOFF(CFS) =  111.87
TC(MIN.) =  16.50

****************************************************************************
 FLOW PROCESS FROM NODE    101.00 TO NODE    100.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    585.00  DOWNSTREAM(FEET) =    570.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   220.00   CHANNEL SLOPE =  0.0682
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0682 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =    111.87
 FLOW VELOCITY(FEET/SEC) =   7.03 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   0.52   Tc(MIN.) =  17.03
 LONGEST FLOWPATH FROM NODE    114.00 TO NODE    100.00 =  3418.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    101.00 TO NODE    100.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.184
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2500
S.C.S. CURVE NUMBER (AMC II) =   0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.3903
SUBAREA AREA(ACRES) =    7.37   SUBAREA RUNOFF(CFS) =    7.71
TOTAL AREA(ACRES) =     71.87   TOTAL RUNOFF(CFS) =  117.36
TC(MIN.) =  17.03

****************************************************************************
 FLOW PROCESS FROM NODE    100.00 TO NODE      1.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   555.40  DOWNSTREAM(FEET) =   504.80
 FLOW LENGTH(FEET) =   561.00   MANNING'S N =  0.024
 DEPTH OF FLOW IN  48.0 INCH PIPE IS  24.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  17.89
 GIVEN PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    117.36
 PIPE TRAVEL TIME(MIN.) =   0.52    Tc(MIN.) =  17.55
 LONGEST FLOWPATH FROM NODE    114.00 TO NODE      1.00 =  3979.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =     71.87  TC(MIN.) =     17.55
 PEAK FLOW RATE(CFS)    =    117.36
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

RATIONAL METHOD HYDROGRAPH PROGRAM
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RUN DATE 9/29/2006
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 18 MIN.
6 H RAINFALL 3.5 INCHES
BA REA 71.87 ACRES
RUNOFF COEFFICIENT 0.3903
PEAK DISCHARGE 117.36 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 18	DISCHARGE (CFS) = 5.9
TIME (MIN) = 36	DISCHARGE (CFS) = 6.3
TIME (MIN) = 54	DISCHARGE (CFS) = 6.6
TIME (MIN) = 72	DISCHARGE (CFS) = 7.2
TIME (MIN) = 90	DISCHARGE (CFS) = 7.5
TIME (MIN) = 108	DISCHARGE (CFS) = 8.3
TIME (MIN) = 126	DISCHARGE (CFS) = 8.8
TIME (MIN) = 144	DISCHARGE (CFS) = 10.1
TIME (MIN) = 162	DISCHARGE (CFS) = 11
TIME (MIN) = 180	DISCHARGE (CFS) = 13.4
TIME (MIN) = 198	DISCHARGE (CFS) = 15.3
TIME (MIN) = 216	DISCHARGE (CFS) = 22.4
TIME (MIN) = 234	DISCHARGE (CFS) = 27.5
TIME (MIN) = 252	DISCHARGE (CFS) = 117.36
TIME (MIN) = 270	DISCHARGE (CFS) = 18
TIME (MIN) = 288	DISCHARGE (CFS) = 12
TIME (MIN) = 306	DISCHARGE (CFS) = 9.4
TIME (MIN) = 324	DISCHARGE (CFS) = 7.9
TIME (MIN) = 342	DISCHARGE (CFS) = 6.9
TIME (MIN) = 360	DISCHARGE (CFS) = 6.1
TIME (MIN) = 378	DISCHARGE (CFS) = 0

```
**************************************************************************
                HYDRAULICS ELEMENTS - II  PROGRAM PACKAGE

                STORAGE BASIN HYDROGRAPH ROUTING MODEL
**************************************************************************
        (c) Copyright 1983-2004 Advanced Engineering Software (aes)
            Ver. 10.0  Release Date: 01/01/2004  License ID 1355

                          Analysis prepared by:

                    FUSCOE ENGINEERING - SAN DIEGO, INC.
                      6390 GREENWICH DRIVE, SUITE 170
                        SAN DIEGO, CALIFORNIA 92122
                             (858) 554-1500

 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                 *
* SUBBASIN # 1 EXISTING DETENTION STORAGE ROUTING W/ 42" RESTRICTOR      *
* 2469.01A - OCTOBER 2006                                                *
 ************************************************************************

    FILE NAME: MMDET01P.DAT
    TIME/DATE OF STUDY: 10:08 09/29/2006
==========================================================================
    ENTERED INFORMATION:
--------------------------------------------------------------------------
    TOTAL NUMBER OF INFLOW HYDROGRAPH INTERVALS =   43
    CONSTANT HYDROGRAPH TIME UNIT(MINUTES) =    9.000
    ASSUMED INITIAL DEPTH(FEET) IN STORAGE BASIN =    0.00
--------------------------------------------------------------------------
    ENTERED INFLOW HYDROGRAPH ORDINATES(CFS):
    *INTERVAL    FLOW    *INTERVAL    FLOW    *INTERVAL    FLOW    *
    * NUMBER     (CFS)   * NUMBER     (CFS)   * NUMBER     (CFS)   *
    *    1:        0.00*    2:        3.00*    3:        5.90*
    *    4:        6.10*    5:        6.30*    6:        6.50*
    *    7:        6.60*    8:        6.90*    9:        7.20*
    *   10:        7.40*   11:        7.50*   12:        7.90*
    *   13:        8.30*   14:        8.60*   15:        8.80*
    *   16:        9.50*   17:       10.10*   18:       10.60*
    *   19:       11.00*   20:       12.20*   21:       13.40*
    *   22:       14.40*   23:       15.30*   24:       18.90*
    *   25:       22.40*   26:       25.00*   27:       27.50*
    *   28:       72.40*   29:      117.40*   30:       67.70*
    *   31:       18.00*   32:       15.00*   33:       12.00*
    *   34:       10.70*   35:        9.40*   36:        8.70*
    *   37:        7.90*   38:        7.40*   39:        6.90*
    *   40:        6.50*   41:        6.10*   42:        3.10*
    *   43:        0.00*
==========================================================================
    DEPTH-VS.-STORAGE AND DEPTH-VS.-DISCHARGE INFORMATION:
--------------------------------------------------------------------------
    TOTAL NUMBER OF BASIN DEPTH INFORMATION ENTRIES =   6
--------------------------------------------------------------------------
    *BASIN-DEPTH  STORAGE    OUTFLOW  **BASIN-DEPTH  STORAGE    OUTFLOW  *
    *   (FEET)  (ACRE-FEET)   (CFS)   **   (FEET)  (ACRE-FEET)   (CFS)   *
    *     0.000      0.000     0.000**     2.000      0.210    22.000*
    *     3.000      0.320    43.000**     4.000      0.420    57.000*
    *     5.000      0.525    68.000**    10.000      1.900   110.000*
**************************************************************************
--------------------------------------------------------------------------
    INITIAL BASIN DEPTH(FEET) =    0.00
    INITIAL BASIN STORAGE(ACRE-FEET) =       0.00
```

INITIAL BASIN OUTFLOW(CFS) = 0.00

BASIN STORAGE, OUTFLOW AND DEPTH ROUTING VALUES:

INTERVAL NUMBER	{S-O*DT/2} (ACRE-FEET)	{S+O*DT/2} (ACRE-FEET)
1	0.00000	0.00000
2	0.07364	0.34636
3	0.05347	0.58653
4	0.06669	0.77331
5	0.10351	0.94649
6	1.21818	2.58182

WHERE S=STORAGE(AF);O=OUTFLOW(AF/MIN.);DT=UNIT(MIN.)

UNIT-HYDROGRAPH STORAGE-BASIN ROUTING

NOTE: COMPUTED BASIN DEPTH, OUTFLOW, AND STORAGE QUANTITIES OCCUR AT THE GIVEN TIME. BASIN INFLOW VALUES REPRESENT THE AVERAGE INFLOW DURING THE RECENT HYDROGRAPH UNIT INTERVAL.

GRAPH NOTATION: "I"=MEAN UNIT INFLOW; "O"=OUTFLOW AT GIVEN TIME

TIME (HOURS)	INFLOW (CFS)	OUTFLOW (CFS)	STORAGE (ACRE-FT)	0. 29. 59. 88. 117.
0.15	0.00	0.00	0.000	o . . . .
[BASIN DEPTH(FEET) = 0.00]				
0.30	3.00	2.36	0.023	o . . . .
[BASIN DEPTH(FEET) = 0.21]				
0.45	5.90	5.15	0.049	.o . . . .
[BASIN DEPTH(FEET) = 0.47]				
0.60	6.10	5.90	0.056	.o . . . .
[BASIN DEPTH(FEET) = 0.54]				
0.75	6.30	6.21	0.059	.o . . . .
[BASIN DEPTH(FEET) = 0.56]				
0.90	6.50	6.44	0.061	.o . . . .
[BASIN DEPTH(FEET) = 0.59]				
1.05	6.60	6.57	0.063	.o . . . .
[BASIN DEPTH(FEET) = 0.60]				
1.20	6.90	6.83	0.065	.o . . . .
[BASIN DEPTH(FEET) = 0.62]				
1.35	7.20	7.12	0.068	.o . . . .
[BASIN DEPTH(FEET) = 0.65]				
1.50	7.40	7.34	0.070	. o . . . .
[BASIN DEPTH(FEET) = 0.67]				
1.65	7.50	7.47	0.071	. o . . . .
[BASIN DEPTH(FEET) = 0.68]				
1.80	7.90	7.81	0.075	. o . . . .
[BASIN DEPTH(FEET) = 0.71]				
1.95	8.30	8.20	0.078	. o . . . .
[BASIN DEPTH(FEET) = 0.75]				
2.10	8.60	8.51	0.081	. o . . . .
[BASIN DEPTH(FEET) = 0.77]				
2.25	8.80	8.74	0.083	. o . . . .
[BASIN DEPTH(FEET) = 0.79]				
2.40	9.50	9.34	0.089	. o . . . .
[BASIN DEPTH(FEET) = 0.85]				
2.55	10.10	9.94	0.095	. o . . . .
[BASIN DEPTH(FEET) = 0.90]				
2.70	10.60	10.46	0.100	. o . . . .

```
  [BASIN DEPTH(FEET) =    0.95]
2.85    11.00    10.89      0.104 . O     .       .       .       .
  [BASIN DEPTH(FEET) =    0.99]
3.00    12.20    11.92      0.114 .  O    .       .       .       .
  [BASIN DEPTH(FEET) =    1.08]
3.15    13.40    13.09      0.125 .  O    .       .       .       .
  [BASIN DEPTH(FEET) =    1.19]
3.30    14.40    14.12      0.135 .  O    .       .       .       .
  [BASIN DEPTH(FEET) =    1.28]
3.45    15.30    15.05      0.144 .   O   .       .       .       .
  [BASIN DEPTH(FEET) =    1.37]
3.60    18.90    18.08      0.173 .   OI  .       .       .       .
  [BASIN DEPTH(FEET) =    1.64]
3.75    22.40    21.48      0.205 .    OI .       .       .       .
  [BASIN DEPTH(FEET) =    1.95]
3.90    25.00    25.10      0.226 .     O .       .       .       .
  [BASIN DEPTH(FEET) =    2.15]
4.05    27.50    27.70      0.240 .      O.       .       .       .
  [BASIN DEPTH(FEET) =    2.27]
4.20    72.40    68.49      0.541 .       .       . OI    .       .
  [BASIN DEPTH(FEET) =    5.06]
4.35   117.40    84.06      1.051 .       .       .     O .       I
  [BASIN DEPTH(FEET) =    6.91]
4.50    67.70    78.85      0.880 .       .       . I  O  .       .
  [BASIN DEPTH(FEET) =    6.29]
4.65    18.00    45.11      0.335 .   I   .   O   .       .       .
  [BASIN DEPTH(FEET) =    3.15]
4.80    15.00    15.33      0.146 .   O   .       .       .       .
  [BASIN DEPTH(FEET) =    1.39]
4.95    12.00    12.71      0.121 .  O    .       .       .       .
  [BASIN DEPTH(FEET) =    1.16]
5.10    10.70    11.13      0.106 . IO    .       .       .       .
  [BASIN DEPTH(FEET) =    1.01]
5.25     9.40     9.77      0.093 . O     .       .       .       .
  [BASIN DEPTH(FEET) =    0.89]
5.40     8.70     8.93      0.085 . O     .       .       .       .
  [BASIN DEPTH(FEET) =    0.81]
5.55     7.90     8.12      0.077 . O     .       .       .       .
  [BASIN DEPTH(FEET) =    0.74]
5.70     7.40     7.55      0.072 . O     .       .       .       .
  [BASIN DEPTH(FEET) =    0.69]
5.85     6.90     7.04      0.067 .O      .       .       .       .
  [BASIN DEPTH(FEET) =    0.64]
6.00     6.50     6.61      0.063 .O      .       .       .       .
  [BASIN DEPTH(FEET) =    0.60]
6.15     6.10     6.21      0.059 .O      .       .       .       .
  [BASIN DEPTH(FEET) =    0.56]
6.30     3.10     3.76      0.036 IO      .       .       .       .
  [BASIN DEPTH(FEET) =    0.34]
6.45     0.00     0.80      0.008 O       .       .       .       .
  [BASIN DEPTH(FEET) =    0.07]
6.60     0.00     0.17      0.002 O       .       .       .       .
  [BASIN DEPTH(FEET) =    0.02]
6.75     0.00     0.04      0.000 O       .       .       .       .
  [BASIN DEPTH(FEET) =    0.00]
6.90     0.00     0.01      0.000 O       .       .       .       .
  [BASIN DEPTH(FEET) =    0.00]
7.05     0.00     0.00      0.000 O       .       .       .       .
  [BASIN DEPTH(FEET) =    0.00]
7.20     0.00     0.00      0.000 O       .       .       .       .
  [BASIN DEPTH(FEET) =    0.00]
7.35     0.00     0.00      0.000 O       .       .       .       .
  [BASIN DEPTH(FEET) =    0.00]
```

```
7.50      0.00      0.00        0.000 O        .        .        .        .
  [BASIN DEPTH(FEET) =     0.00]
7.65      0.00      0.00        0.000 O        .        .        .        .
  [BASIN DEPTH(FEET) =     0.00]
7.80      0.00      0.00        0.000 O        .        .        .        .
  [BASIN DEPTH(FEET) =     0.00]
7.95      0.00      0.00        0.000 O        .        .        .        .
  [BASIN DEPTH(FEET) =     0.00]
8.10      0.00      0.00        0.000 O        .        .        .        .
  [BASIN DEPTH(FEET) =     0.00]
8.25      0.00      0.00        0.000 O        .        .        .        .
  [BASIN DEPTH(FEET) =     0.00]
8.40      0.00      0.00        0.000 O        .        .        .        .
  [BASIN DEPTH(FEET) =     0.00]
8.55      0.00      0.00        0.000 O        .        .        .        .
  [BASIN DEPTH(FEET) =     0.00]
8.70      0.00      0.00        0.000 O        .        .        .        .
  [BASIN DEPTH(FEET) =     0.00]
8.85      0.00      0.00        0.000 O        .        .        .        .
  [BASIN DEPTH(FEET) =     0.00]
9.00      0.00      0.00        0.000 O        .        .        .        .
  [BASIN DEPTH(FEET) =     0.00]
```

STORAGE 1
EXISTING CONDITIONS

LAWRENCE WELK LN

LAWRENCE WELK CT

EXISTING RESERVOIR

100

101

101.8

101.6

101.4

102

202

201.5

201

200

1

2

48" CSP

30" CSP

I-15

SCATTERED ROCKS

SCALE: 1" = 250'

FUSCOE ENGINEERING

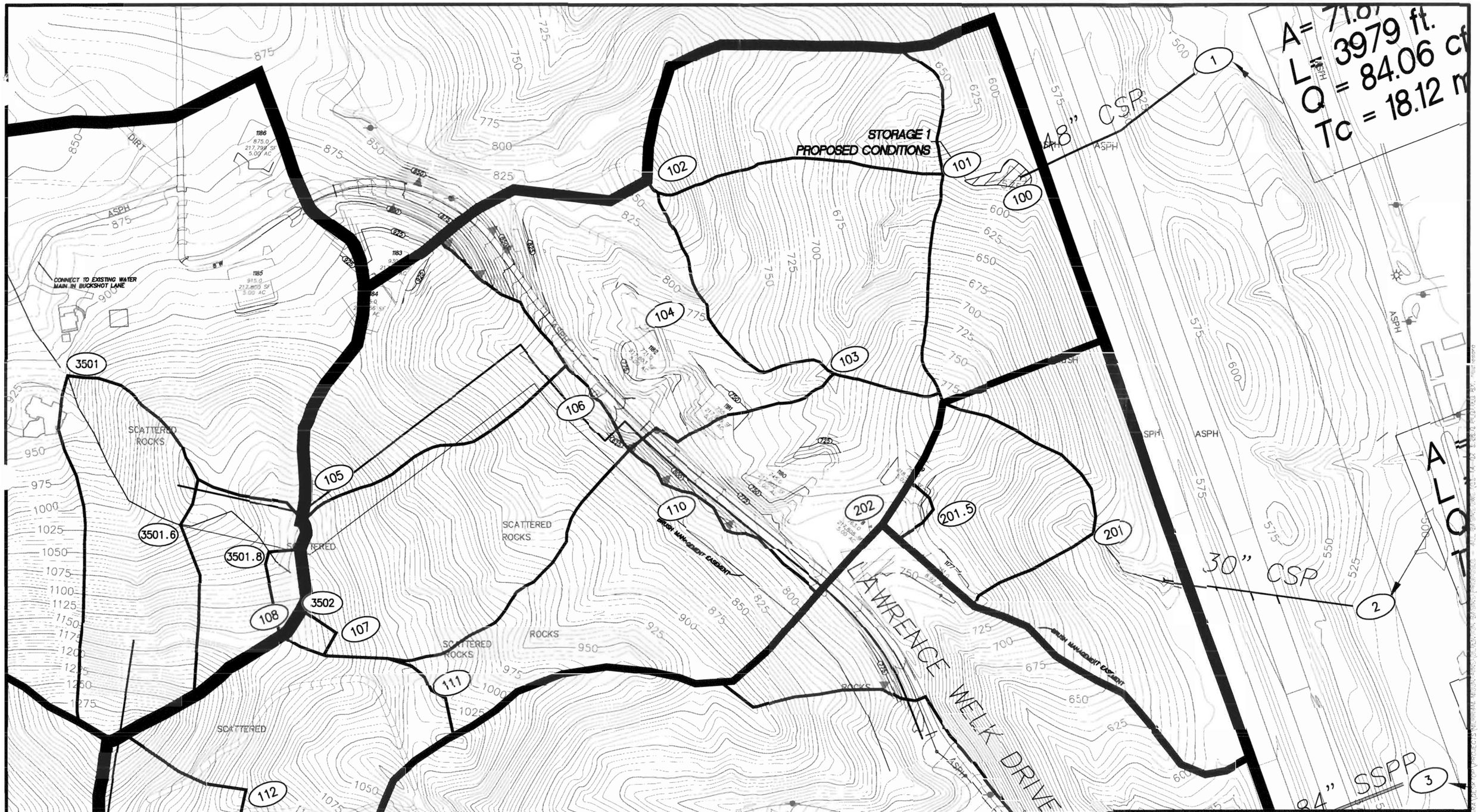
6390 Greenwich Drive, Suite 170
San Diego, California 92122
tel 858.554.1500 • fax 858.597.0335
www.fuscoe.com

MERRIAM MOUNTAINS

FIGURE B1A - EXISTING DETENTION STORAGE

STORAGE 1

EXISTING CONDITION



SCALE: 1" = 250'

FUSCOE ENGINEERING
6390 Greenwich Drive, Suite 170
San Diego, California 92122
tel 858.554.1500 • fax 858.597.0335
www.fuscoe.com

MERRIAM MOUNTAINS

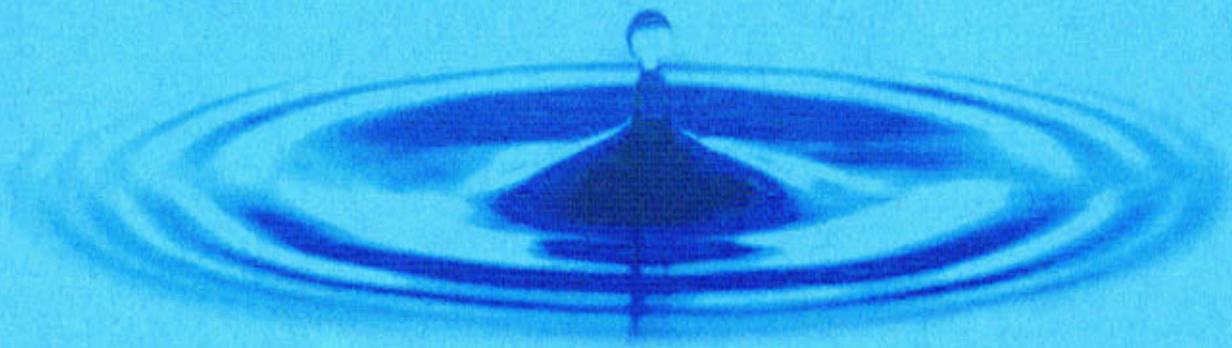
FIGURE B1B - EXISTING DETENTION STORAGE

STORAGE 1 PROPOSED CONDITION

APPENDIX B

Existing Detention Storage Analysis

SUB-BASIN 10



FUSCOE
ENGINEERING
6390 Greenwich Drive, Suite 170
San Diego, California 92122
tel 858.554.1500 • fax 858.597.0335
www.fuscoe.com

Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR10

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
1041	1038	2	1,485.0	1,470.0	75.0	0.35	0.61	Initial
1038	1036	5	1,470.0	1,460.0	300.0			
1038	1036	8				0.35	2.18	
1036	1034	5	1,460.0	1,325.0	643.0			
1036	1034	8				0.35	8.09	
1034	1030	5	1,325.0	1,175.0	646.0			
1034	1030	8				0.35	20.55	
1030	1030	1						1 of 2
1031	1030.8	2	1,420.0	1,410.0	75.0	0.35	0.62	Initial
1030.8	1030.6	5	1,410.0	1,365.0	300.0			
1030.8	1030.6	8				0.35	10.56	
1030.6	1030.4	5	1,365.0	1,285.0	600.0			
1030.6	1030.4	8				0.35	21.21	
1030.4	1030	5	1,285.0	1,175.0	610.0			
1030.4	1030	8				0.35	18.41	
1030	1030	1						2 of 2
1030	1023	5	1,175.0	950.0	1,130.0			
1030	1023	8				0.342	40.13	
1023	1023	1						1 of 2
1025	1024.8	2	1,480.0	1,470.0	75.0	0.35	1.77	
1024.8	1024.4	5	1,470.0	1,440.0	300.0			
1024.8	1024.6	8				0.35	6.04	
1024.6	1024.4	5	1,440.0	1,360.0	600.0			
1024.6	1024.4	8				0.35	17.55	
1024.4	1024	5	1,360.0	1,080.0	1,175.0			
1024.4	1024	8				0.35	68.27	
1024	1023	5	1,080.0	950.0	805.0			
1023	1023	1						2 of 2
1023	1021	5	950.0	750.0	2,070.0			
1022	1021	8				0.29	91.65	
1021	1002	5	750.0	675.0	625.0			
1002	1002	1						1 of 2
1004	1003.8	2	1,450.0	1,435.0	75.0	0.35	0.27	Initial
1003.8	1003.6	5	1,435.0	1,410.0	300.0			
1003.8	1003.6	8				0.35	2.86	
1003.6	1003.4	5	1,410.0	1,135.0	818.0			
1003.6	1003.4	8				0.27	13.89	
1003.4	1003	5	1,135.0	965.0	1,370.0			
1003.4	1003	8				0.278	55.85	
1003	1002	5	975.0	700.0	1,941.0			
1003	1002	8				0.27	106.38	
1002	1002	1						2 of 2
1002	1001	5	700.0	675.0	1,175.0			
1001	10	4	675.0	550.0	755.0			Ex. 42" CSP Caltrans
							486.89	Total Area

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

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                        2003,1985,1981 HYDROLOGY MANUAL
        (c) Copyright 1982-2004 Advanced Engineering Software (aes)
            Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                          Analysis prepared by:

                    FUSCOE ENGINEERING - SAN DIEGO, INC.
                      6390 GREENWICH DRIVE, SUITE 170
                        SAN DIEGO, CALIFORNIA 92122
                             (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                  *
* SUBBASIN 10 - NO DETENTION ROUTING                                      *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MERR10.DAT
  TIME/DATE OF STUDY: 11:57 09/28/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   1041.00 TO NODE   1038.00 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) =    75.00
  UPSTREAM ELEVATION(FEET) =   1485.00
  DOWNSTREAM ELEVATION(FEET) =   1470.00
  ELEVATION DIFFERENCE(FEET) =     15.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
SUBAREA RUNOFF(CFS) =      1.87
TOTAL AREA(ACRES) =      0.61   TOTAL RUNOFF(CFS) =      1.87

****************************************************************************
FLOW PROCESS FROM NODE   1038.00 TO NODE   1036.00 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1470.00  DOWNSTREAM(FEET) =   1460.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.0333
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .0333 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) =      1.87
FLOW VELOCITY(FEET/SEC) =   1.26 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   3.97   Tc(MIN.) =   9.40
LONGEST FLOWPATH FROM NODE   1041.00 TO NODE   1036.00 =   375.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   1038.00 TO NODE   1036.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.138
*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) =     2.18   SUBAREA RUNOFF(CFS) =     4.68
TOTAL AREA(ACRES) =      2.79   TOTAL RUNOFF(CFS) =    5.99
TC(MIN.) =   9.40

****************************************************************************
FLOW PROCESS FROM NODE   1036.00 TO NODE   1034.00 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1460.00  DOWNSTREAM(FEET) =   1325.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   643.00   CHANNEL SLOPE =  0.2100
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .1650 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) =      5.99
FLOW VELOCITY(FEET/SEC) =   4.13 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   2.60   Tc(MIN.) =  11.99
LONGEST FLOWPATH FROM NODE   1041.00 TO NODE   1034.00 =  1018.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   1036.00 TO NODE   1034.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.244
*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) =     8.09   SUBAREA RUNOFF(CFS) =    14.85
TOTAL AREA(ACRES) =     10.88   TOTAL RUNOFF(CFS) =   19.97
TC(MIN.) =  11.99

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

```
 FLOW PROCESS FROM NODE   1034.00 TO NODE   1030.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1325.00  DOWNSTREAM(FEET) =   1175.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   646.00   CHANNEL SLOPE =  0.2322
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1741 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     19.97
 FLOW VELOCITY(FEET/SEC) =   6.33 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.70   Tc(MIN.) =  13.69
 LONGEST FLOWPATH FROM NODE   1041.00 TO NODE   1030.00 =  1664.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1034.00 TO NODE   1030.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.815
 *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) =   20.55   SUBAREA RUNOFF(CFS) =   34.63
 TOTAL AREA(ACRES) =     31.43   TOTAL RUNOFF(CFS) =   52.96
 TC(MIN.) =  13.69

****************************************************************************
 FLOW PROCESS FROM NODE   1030.00 TO NODE   1030.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  13.69
 RAINFALL INTENSITY(INCH/HR) =   4.81
 TOTAL STREAM AREA(ACRES) =    31.43
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     52.96

****************************************************************************
 FLOW PROCESS FROM NODE   1031.00 TO NODE   1030.80 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) =    75.00
 UPSTREAM ELEVATION(FEET) =   1420.00
 DOWNSTREAM ELEVATION(FEET) =   1410.00
 ELEVATION DIFFERENCE(FEET) =     10.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
 SUBAREA RUNOFF(CFS) =      1.90
 TOTAL AREA(ACRES) =      0.62   TOTAL RUNOFF(CFS) =      1.90

****************************************************************************
 FLOW PROCESS FROM NODE   1030.80 TO NODE   1030.60 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1410.00  DOWNSTREAM(FEET) =   1365.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.1500
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1350 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      1.90
  FLOW VELOCITY(FEET/SEC) =   2.55 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.96   Tc(MIN.) =   7.39
  LONGEST FLOWPATH FROM NODE   1031.00 TO NODE   1030.60 =   375.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1030.80 TO NODE   1030.60 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.167
  *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) =   10.56   SUBAREA RUNOFF(CFS) =   26.49
  TOTAL AREA(ACRES) =     11.18   TOTAL RUNOFF(CFS) =   28.05
  TC(MIN.) =   7.39

****************************************************************************
  FLOW PROCESS FROM NODE   1030.60 TO NODE   1030.40 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1365.00  DOWNSTREAM(FEET) =   1285.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.1333
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1239 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     28.05
  FLOW VELOCITY(FEET/SEC) =   5.98 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.67   Tc(MIN.) =   9.06
  LONGEST FLOWPATH FROM NODE   1031.00 TO NODE   1030.40 =   975.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1030.60 TO NODE   1030.40 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.284
  *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) =   21.21   SUBAREA RUNOFF(CFS) =   46.65
  TOTAL AREA(ACRES) =     32.39   TOTAL RUNOFF(CFS) =   71.24
  TC(MIN.) =   9.06

****************************************************************************
  FLOW PROCESS FROM NODE   1030.40 TO NODE   1030.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1285.00  DOWNSTREAM(FEET) =   1175.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   610.00   CHANNEL SLOPE =  0.1803
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1502 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
```

```
 CHANNEL FLOW THRU SUBAREA(CFS) =     71.24
 FLOW VELOCITY(FEET/SEC) =   8.98 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.13   Tc(MIN.) =  10.19
 LONGEST FLOWPATH FROM NODE   1031.00 TO NODE   1030.00 =  1585.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1030.40 TO NODE   1030.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.825
 *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) =   18.41   SUBAREA RUNOFF(CFS) =   37.53
 TOTAL AREA(ACRES) =     50.80   TOTAL RUNOFF(CFS) =  103.56
 TC(MIN.) =  10.19

****************************************************************************
 FLOW PROCESS FROM NODE   1030.00 TO NODE   1030.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  10.19
 RAINFALL INTENSITY(INCH/HR) =   5.82
 TOTAL STREAM AREA(ACRES) =    50.80
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    103.56

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc       INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
    1        52.96     13.69         4.815         31.43
    2       103.56     10.19         5.825         50.80

 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       142.99     10.19         5.825
    2       138.57     13.69         4.815

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    142.99   Tc(MIN.) =   10.19
 TOTAL AREA(ACRES) =     82.23
 LONGEST FLOWPATH FROM NODE   1041.00 TO NODE   1030.00 =  1664.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1030.00 TO NODE   1023.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1175.00  DOWNSTREAM(FEET) =    950.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1130.00   CHANNEL SLOPE =  0.1991
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1596 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =    142.99
```

```
 FLOW VELOCITY(FEET/SEC) =  11.68 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.61   Tc(MIN.) =  11.81
 LONGEST FLOWPATH FROM NODE   1041.00 TO NODE   1023.00 =  2794.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1030.00 TO NODE   1023.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.298
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3420
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3474
 SUBAREA AREA(ACRES) =   40.13   SUBAREA RUNOFF(CFS) =   72.71
 TOTAL AREA(ACRES) =    122.36   TOTAL RUNOFF(CFS) =  225.20
 TC(MIN.) =  11.81

****************************************************************************
 FLOW PROCESS FROM NODE   1023.00 TO NODE   1023.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  11.81
 RAINFALL INTENSITY(INCH/HR) =   5.30
 TOTAL STREAM AREA(ACRES) =   122.36
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    225.20

****************************************************************************
 FLOW PROCESS FROM NODE   1025.00 TO NODE   1024.80 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) =    75.00
 UPSTREAM ELEVATION(FEET) =   1480.00
 DOWNSTREAM ELEVATION(FEET) =   1470.00
 ELEVATION DIFFERENCE(FEET) =     10.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
 SUBAREA RUNOFF(CFS) =      5.42
 TOTAL AREA(ACRES) =      1.77   TOTAL RUNOFF(CFS) =      5.42

****************************************************************************
 FLOW PROCESS FROM NODE   1024.80 TO NODE   1024.60 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1470.00  DOWNSTREAM(FEET) =   1440.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.1000
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1000 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      5.42
 FLOW VELOCITY(FEET/SEC) =   3.11 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.61   Tc(MIN.) =   7.04
 LONGEST FLOWPATH FROM NODE   1025.00 TO NODE   1024.60 =   375.00 FEET.
```

```
****************************************************************************
 FLOW PROCESS FROM NODE   1024.80 TO NODE   1024.60 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.398
 *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) =     6.04   SUBAREA RUNOFF(CFS) =   15.64
 TOTAL AREA(ACRES) =       7.81   TOTAL RUNOFF(CFS) =   20.22
 TC(MIN.) =   7.04

****************************************************************************
 FLOW PROCESS FROM NODE   1024.60 TO NODE   1024.40 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1440.00  DOWNSTREAM(FEET) =   1360.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.1333
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1239 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     20.22
 FLOW VELOCITY(FEET/SEC) =   5.36 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.86   Tc(MIN.) =   8.90
 LONGEST FLOWPATH FROM NODE   1025.00 TO NODE   1024.40 =   975.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1024.60 TO NODE   1024.40 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.358
 *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) =   17.55   SUBAREA RUNOFF(CFS) =   39.05
 TOTAL AREA(ACRES) =     25.36   TOTAL RUNOFF(CFS) =   56.43
 TC(MIN.) =   8.90

****************************************************************************
 FLOW PROCESS FROM NODE   1024.40 TO NODE   1024.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1360.00  DOWNSTREAM(FEET) =   1080.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1175.00   CHANNEL SLOPE =  0.2383
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1761 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     56.43
 FLOW VELOCITY(FEET/SEC) =   9.00 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.18   Tc(MIN.) =  11.07
 LONGEST FLOWPATH FROM NODE   1025.00 TO NODE   1024.00 =  2150.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1024.40 TO NODE   1024.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.521
*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) =   68.27   SUBAREA RUNOFF(CFS) =  131.93
TOTAL AREA(ACRES) =     93.63   TOTAL RUNOFF(CFS) =  180.93
TC(MIN.) =  11.07

****************************************************************************
FLOW PROCESS FROM NODE   1024.00 TO NODE   1023.00 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   1080.00  DOWNSTREAM(FEET) =    950.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   805.00   CHANNEL SLOPE =  0.1615
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .1407 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) =    180.93
FLOW VELOCITY(FEET/SEC) =  11.86 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) =   1.13   Tc(MIN.) =  12.21
LONGEST FLOWPATH FROM NODE   1025.00 TO NODE   1023.00 =  2955.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   1023.00 TO NODE   1023.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
TIME OF CONCENTRATION(MIN.) =  12.21
RAINFALL INTENSITY(INCH/HR) =   5.19
TOTAL STREAM AREA(ACRES) =    93.63
PEAK FLOW RATE(CFS) AT CONFLUENCE =    180.93

** CONFLUENCE DATA **
STREAM     RUNOFF      Tc       INTENSITY      AREA
NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
    1      225.20    11.81        5.298        122.36
    2      180.93    12.21        5.186         93.63

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      400.21    11.81        5.298
    2      401.35    12.21        5.186

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =    401.35   Tc(MIN.) =   12.21
TOTAL AREA(ACRES) =    215.99
LONGEST FLOWPATH FROM NODE   1025.00 TO NODE   1023.00 =  2955.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   1023.00 TO NODE   1021.00 IS CODE =  53
----------------------------------------------------------------------------
>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =    950.00  DOWNSTREAM(FEET) =    750.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2070.00   CHANNEL SLOPE =  0.0966
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0966 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =    401.35
 FLOW VELOCITY(FEET/SEC) =  12.81 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.69   Tc(MIN.) =  14.90
 LONGEST FLOWPATH FROM NODE   1025.00 TO NODE   1021.00 =  5025.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1022.00 TO NODE   1021.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.560
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2900
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3311
 SUBAREA AREA(ACRES) =   91.65   SUBAREA RUNOFF(CFS) =  121.20
 TOTAL AREA(ACRES) =    307.64   TOTAL RUNOFF(CFS) =  464.46
 TC(MIN.) =  14.90

****************************************************************************
 FLOW PROCESS FROM NODE   1021.00 TO NODE   1002.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    750.00  DOWNSTREAM(FEET) =    675.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   625.00   CHANNEL SLOPE =  0.1200
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1150 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =    464.46
 FLOW VELOCITY(FEET/SEC) =  14.68 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   0.71   Tc(MIN.) =  15.61
 LONGEST FLOWPATH FROM NODE   1025.00 TO NODE   1002.00 =  5650.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1002.00 TO NODE   1002.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  15.61
 RAINFALL INTENSITY(INCH/HR) =   4.43
 TOTAL STREAM AREA(ACRES) =   307.64
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    464.46

****************************************************************************
 FLOW PROCESS FROM NODE   1004.00 TO NODE   1003.80 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) =    75.00
 UPSTREAM ELEVATION(FEET) =   1450.00
 DOWNSTREAM ELEVATION(FEET) =   1435.00
 ELEVATION DIFFERENCE(FEET) =     15.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
```

```
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
 SUBAREA RUNOFF(CFS) =      0.83
 TOTAL AREA(ACRES) =      0.27   TOTAL RUNOFF(CFS) =      0.83

****************************************************************************
 FLOW PROCESS FROM NODE   1003.80 TO NODE   1003.60 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1435.00  DOWNSTREAM(FEET) =   1410.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.0833
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0833 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.83
 FLOW VELOCITY(FEET/SEC) =   1.62 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.09   Tc(MIN.) =   8.52
 LONGEST FLOWPATH FROM NODE   1004.00 TO NODE   1003.60 =   375.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1003.80 TO NODE   1003.60 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.539
 *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) =     2.86   SUBAREA RUNOFF(CFS) =     6.55
 TOTAL AREA(ACRES) =      3.13   TOTAL RUNOFF(CFS) =    7.16
 TC(MIN.) =   8.52

****************************************************************************
 FLOW PROCESS FROM NODE   1003.60 TO NODE   1003.40 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1410.00  DOWNSTREAM(FEET) =   1135.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   818.00   CHANNEL SLOPE =  0.3362
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2028 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      7.16
 FLOW VELOCITY(FEET/SEC) =   4.86 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.81   Tc(MIN.) =  11.33
 LONGEST FLOWPATH FROM NODE   1004.00 TO NODE   1003.40 =  1193.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1003.60 TO NODE   1003.40 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.442
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2847
 SUBAREA AREA(ACRES) =    13.89   SUBAREA RUNOFF(CFS) =    20.41
 TOTAL AREA(ACRES) =      17.02   TOTAL RUNOFF(CFS) =   26.37
 TC(MIN.) =  11.33
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1003.40 TO NODE   1003.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1135.00  DOWNSTREAM(FEET) =    965.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1370.00   CHANNEL SLOPE =  0.1241
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1177 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     26.37
  FLOW VELOCITY(FEET/SEC) =   5.71 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.00   Tc(MIN.) =  15.32
  LONGEST FLOWPATH FROM NODE   1004.00 TO NODE   1003.00 =  2563.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1003.40 TO NODE   1003.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.478
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2811
  SUBAREA AREA(ACRES) =   55.85   SUBAREA RUNOFF(CFS) =   70.03
  TOTAL AREA(ACRES) =     72.87   TOTAL RUNOFF(CFS) =   91.73
  TC(MIN.) =  15.32

****************************************************************************
  FLOW PROCESS FROM NODE   1003.00 TO NODE   1002.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    975.00  DOWNSTREAM(FEET) =    700.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1941.00   CHANNEL SLOPE =  0.1417
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1295 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     91.73
  FLOW VELOCITY(FEET/SEC) =   9.07 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.57   Tc(MIN.) =  18.89
  LONGEST FLOWPATH FROM NODE   1004.00 TO NODE   1002.00 =  4504.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1003.00 TO NODE   1002.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.913
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2745
  SUBAREA AREA(ACRES) =  106.38   SUBAREA RUNOFF(CFS) =  112.39
  TOTAL AREA(ACRES) =    179.25   TOTAL RUNOFF(CFS) =  192.54
  TC(MIN.) =  18.89

****************************************************************************
  FLOW PROCESS FROM NODE   1002.00 TO NODE   1002.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```

```
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  18.89
  RAINFALL INTENSITY(INCH/HR) =   3.91
  TOTAL STREAM AREA(ACRES) =   179.25
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    192.54

  ** CONFLUENCE DATA **
  STREAM      RUNOFF       Tc       INTENSITY       AREA
  NUMBER       (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
      1       464.46     15.61         4.425        307.64
      2       192.54     18.89         3.913        179.25

  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       623.56     15.61        4.425
      2       603.23     18.89        3.913

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    623.56   Tc(MIN.) =   15.61
  TOTAL AREA(ACRES) =    486.89
  LONGEST FLOWPATH FROM NODE   1025.00 TO NODE   1002.00 =  5650.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1002.00 TO NODE   1001.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    700.00  DOWNSTREAM(FEET) =    675.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1175.00   CHANNEL SLOPE =  0.0213
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0213 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    623.56
  FLOW VELOCITY(FEET/SEC) =   6.96 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.81   Tc(MIN.) =  18.42
  LONGEST FLOWPATH FROM NODE   1025.00 TO NODE   1001.00 =  6825.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1001.00 TO NODE     10.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   675.00  DOWNSTREAM(FEET) =   550.00
  FLOW LENGTH(FEET) =   755.00   MANNING'S N =  0.015
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  38.58
  (PIPE FLOW VELOCITY CORRESPONDING TO NORMAL-DEPTH FLOW
   AT DEPTH = 0.94 * DIAMETER)
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    623.56
  PIPE TRAVEL TIME(MIN.) =   0.33    Tc(MIN.) =  18.75
  LONGEST FLOWPATH FROM NODE   1025.00 TO NODE     10.00 =  7580.00 FEET.
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    486.89  TC(MIN.) =     18.75
```

```
  PEAK FLOW RATE(CFS)    =     623.56
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS

```

RATIONAL METHOD HYDROGRAPH PROGRAM
COPYRIGHT 1992, 2001 RICK ENGINEERING COMPANY

RUN DATE 9/28/2006
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 19 MIN.
6 H[illegible] RAINFALL 3.5 INCHES
BA[illegible]REA 486.89 ACRES
RUNOFF COEFFICIENT 0.31
PEAK DISCHARGE 623.56 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 19	DISCHARGE (CFS) = 0
TIME (MIN) = 38	DISCHARGE (CFS) = 33
TIME (MIN) = 57	DISCHARGE (CFS) = 34.2
TIME (MIN) = 76	DISCHARGE (CFS) = 37.2
TIME (MIN) = 95	DISCHARGE (CFS) = 39
TIME (MIN) = 114	DISCHARGE (CFS) = 43.2
TIME (MIN) = 133	DISCHARGE (CFS) = 45.9
TIME (MIN) = 152	DISCHARGE (CFS) = 52.6
TIME (MIN) = 171	DISCHARGE (CFS) = 57
TIME (MIN) = 190	DISCHARGE (CFS) = 69.7
TIME (MIN) = 209	DISCHARGE (CFS) = 79.3
TIME (MIN) = 228	DISCHARGE (CFS) = 116.5
TIME (MIN) = 247	DISCHARGE (CFS) = 128.9
TIME (MIN) = 266	DISCHARGE (CFS) = 623.56
TIME (MIN) = 285	DISCHARGE (CFS) = 93.4
TIME (MIN) = 304	DISCHARGE (CFS) = 62.5
TIME (MIN) = 323	DISCHARGE (CFS) = 48.9
TIME (MIN) = 342	DISCHARGE (CFS) = 41
TIME (MIN) = 361	DISCHARGE (CFS) = 35.7
TIME (MIN) = 380	DISCHARGE (CFS) = 0

```
**************************************************************************
                HYDRAULICS ELEMENTS - II  PROGRAM PACKAGE

                STORAGE BASIN HYDROGRAPH ROUTING MODEL
**************************************************************************
        (c) Copyright 1983-2004 Advanced Engineering Software (aes)
            Ver. 10.0  Release Date: 01/01/2004  License ID 1355

                          Analysis prepared by:

                    FUSCOE ENGINEERING - SAN DIEGO, INC.
                      6390 GREENWICH DRIVE, SUITE 170
                        SAN DIEGO, CALIFORNIA 92122
                              (858) 554-1500

 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                 *
* SUBBASIN 10 - EXISTING DETENTION STORAGE ROUTING                       *
* 2469.01A - OCTOBER 2006                                               *
 **************************************************************************

    FILE NAME: MMDET10.DAT
    TIME/DATE OF STUDY: 11:51 09/28/2006
==========================================================================
    ENTERED INFORMATION:
--------------------------------------------------------------------------
    TOTAL NUMBER OF INFLOW HYDROGRAPH INTERVALS =   21
    CONSTANT HYDROGRAPH TIME UNIT(MINUTES) =   19.000
    ASSUMED INITIAL DEPTH(FEET) IN STORAGE BASIN =    0.00
--------------------------------------------------------------------------
    ENTERED INFLOW HYDROGRAPH ORDINATES(CFS):
    *INTERVAL    FLOW    *INTERVAL    FLOW    *INTERVAL    FLOW    *
    * NUMBER     (CFS)   * NUMBER     (CFS)   * NUMBER     (CFS)   *
    *    1:        0.00*    2:        0.00*    3:       33.00*
    *    4:       34.20*    5:       37.20*    6:       39.00*
    *    7:       43.20*    8:       45.90*    9:       52.60*
    *   10:       57.00*   11:       69.70*   12:       79.30*
    *   13:      116.50*   14:      128.90*   15:      623.56*
    *   16:       93.40*   17:       62.50*   18:       48.90*
    *   19:       41.00*   20:       35.70*   21:        0.00*
==========================================================================
    DEPTH-VS.-STORAGE AND DEPTH-VS.-DISCHARGE INFORMATION:
--------------------------------------------------------------------------
    TOTAL NUMBER OF BASIN DEPTH INFORMATION ENTRIES =   4
--------------------------------------------------------------------------
    *BASIN-DEPTH  STORAGE    OUTFLOW  **BASIN-DEPTH  STORAGE    OUTFLOW  *
    *   (FEET)  (ACRE-FEET)   (CFS)   **   (FEET)  (ACRE-FEET)   (CFS)   *
    *     0.000      0.000      0.000**      5.000     13.600     79.000*
    *    10.000     32.800    130.000**     15.000     56.500    170.000*
**************************************************************************
--------------------------------------------------------------------------
    INITIAL BASIN DEPTH(FEET) =    0.00
    INITIAL BASIN STORAGE(ACRE-FEET) =       0.00
    INITIAL BASIN OUTFLOW(CFS) =       0.00
--------------------------------------------------------------------------
--------------------------------------------------------------------------
    BASIN STORAGE, OUTFLOW AND DEPTH ROUTING VALUES:
     INTERVAL    {S-O*DT/2}    {S+O*DT/2}
      NUMBER    (ACRE-FEET)  (ACRE-FEET)
          1       0.00000      0.00000
          2      12.56625     14.63375
          3      31.09890     34.50110
```

4 54.27548 58.72452

WHERE S=STORAGE(AF);O=OUTFLOW(AF/MIN.);DT=UNIT(MIN.)

UNIT-HYDROGRAPH STORAGE-BASIN ROUTING

NOTE: COMPUTED BASIN DEPTH, OUTFLOW, AND STORAGE QUANTITIES OCCUR AT THE GIVEN TIME. BASIN INFLOW VALUES REPRESENT THE AVERAGE INFLOW DURING THE RECENT HYDROGRAPH UNIT INTERVAL.

GRAPH NOTATION: "I"=MEAN UNIT INFLOW; "O"=OUTFLOW AT GIVEN TIME

TIME (HOURS)	INFLOW (CFS)	OUTFLOW (CFS)	STORAGE (ACRE-FT)	0. 156. 312. 468. 624.
0.32	0.00	0.00	0.000	O
[BASIN DEPTH(FEET) =	0.00]			
0.63	0.00	0.00	0.000	O
[BASIN DEPTH(FEET) =	0.00]			
0.95	33.00	4.66	0.803	OI
[BASIN DEPTH(FEET) =	0.30]			
1.27	34.20	8.84	1.521	OI
[BASIN DEPTH(FEET) =	0.56]			
1.58	37.20	12.84	2.211	OI
[BASIN DEPTH(FEET) =	0.81]			
1.90	39.00	16.54	2.847	O I
[BASIN DEPTH(FEET) =	1.05]			
2.22	43.20	20.31	3.496	.OI
[BASIN DEPTH(FEET) =	1.29]			
2.53	45.90	23.92	4.118	.OI
[BASIN DEPTH(FEET) =	1.51]			
2.85	52.60	27.97	4.816	.OI
[BASIN DEPTH(FEET) =	1.77]			
3.17	57.00	32.07	5.522	.OI
[BASIN DEPTH(FEET) =	2.03]			
3.48	69.70	37.39	6.437	.O I
[BASIN DEPTH(FEET) =	2.37]			
3.80	79.30	43.31	7.456	. O I
[BASIN DEPTH(FEET) =	2.74]			
4.12	116.50	53.65	9.236	. O I
[BASIN DEPTH(FEET) =	3.40]			
4.43	128.90	64.28	11.066	. O I
[BASIN DEPTH(FEET) =	4.07]			
4.75	623.56	109.57	25.110	. O I
[BASIN DEPTH(FEET) =	8.00]			
5.07	93.40	108.49	24.701	. IO
[BASIN DEPTH(FEET) =	7.89]			
5.38	62.50	105.40	23.538	. I O
[BASIN DEPTH(FEET) =	7.59]			
5.70	48.90	101.60	22.109	. I O
[BASIN DEPTH(FEET) =	7.22]			
6.02	41.00	97.53	20.577	. I O
[BASIN DEPTH(FEET) =	6.82]			
6.33	35.70	93.38	19.013	.I O
[BASIN DEPTH(FEET) =	6.41]			
6.65	0.00	87.10	16.651	I O
[BASIN DEPTH(FEET) =	5.79]			
6.97	0.00	81.25	14.448	I O
[BASIN DEPTH(FEET) =	5.22]			
7.28	0.00	72.26	12.439	I O
[BASIN DEPTH(FEET) =	4.57]			

```
 7.60     0.00    62.05      10.682 I  O    .       .       .       .
   [BASIN DEPTH(FEET) =    3.93]
 7.92     0.00    53.28       9.173 I O     .       .       .       .
   [BASIN DEPTH(FEET) =    3.37]
 8.23     0.00    45.75       7.877 I O     .       .       .       .
   [BASIN DEPTH(FEET) =    2.90]
 8.55     0.00    39.29       6.764 I O     .       .       .       .
   [BASIN DEPTH(FEET) =    2.49]
 8.87     0.00    33.74       5.808 IO      .       .       .       .
   [BASIN DEPTH(FEET) =    2.14]
 9.18     0.00    28.97       4.988 IO      .       .       .       .
   [BASIN DEPTH(FEET) =    1.83]
 9.50     0.00    24.88       4.283 IO      .       .       .       .
   [BASIN DEPTH(FEET) =    1.57]
 9.82     0.00    21.36       3.678 IO      .       .       .       .
   [BASIN DEPTH(FEET) =    1.35]
10.13     0.00    18.35       3.158 O       .       .       .       .
   [BASIN DEPTH(FEET) =    1.16]
10.45     0.00    15.75       2.712 O       .       .       .       .
   [BASIN DEPTH(FEET) =    1.00]
10.77     0.00    13.53       2.329 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.86]
11.08     0.00    11.62       2.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.74]
11.40     0.00     9.98       1.717 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.63]
11.72     0.00     8.57       1.475 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.54]
12.03     0.00     7.36       1.266 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.47]
12.35     0.00     6.32       1.087 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.40]
12.67     0.00     5.42       0.934 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.34]
12.98     0.00     4.66       0.802 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.29]
13.30     0.00     4.00       0.689 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.25]
13.62     0.00     3.43       0.591 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.22]
13.93     0.00     2.95       0.508 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.19]
14.25     0.00     2.53       0.436 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.16]
14.57     0.00     2.17       0.374 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.14]
14.88     0.00     1.87       0.322 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.12]
15.20     0.00     1.60       0.276 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.10]
15.52     0.00     1.38       0.237 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.09]
15.83     0.00     1.18       0.204 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.07]
16.15     0.00     1.02       0.175 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.06]
16.47     0.00     0.87       0.150 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.06]
16.78     0.00     0.75       0.129 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.05]
17.10     0.00     0.64       0.111 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.04]
17.42     0.00     0.55       0.095 O       .       .       .       .
```

```
   [BASIN DEPTH(FEET) =    0.03]
17.73     0.00     0.47       0.082 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.03]
18.05     0.00     0.41       0.070 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.03]
18.37     0.00     0.35       0.060 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.02]
18.68     0.00     0.30       0.052 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.02]
19.00     0.00     0.26       0.044 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.02]
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Job #:
2469.01A

Date:
October 2006

Run Name:
MERR10-P

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Land Use	Runoff Coeff.	Area (ac.)	Comments
1087	1086	2	1,472.0	1,467.0	100.0	21	0.35	0.61	
1086	1085	5	1,467.0	1,450.0	305.0				
1086	1085	8				21	0.35	2.18	
1085	1084	5	1,450.0	1,322.0	677.0				
1085	1084	8				17	0.51	8.11	Weighted C Factor
1084	1080	5	1,322.0		708.0				
1084	1080	8				17	0.39	20.53	Weighted C Factor
1080	1080	1							1 of 2
1083	1082	2	1,600.0		100.0	21	0.35	0.79	
1082	1081	5	1,513.0		628.0				
1082	1081	8				21	0.35	3.73	
1081	1080	5	1,450.0		1,415.0				
1081	1080	8				17	0.39	46.31	Weighted C Factor
1080	1080	1							2 of 2
1080	1051	5	1,165.0		1,200.0				
1080	1051	8				17	0.37	40.16	
1051	1051	10							Bank #1
1056	1055	2	1,455.9		100.0	7	0.79	0.26	
1055	1054	6	1,455.4		425.0	7	0.79	3.66	
1054	1053	3	1,447.0		220.0				
1053	1052	5	1,410.0		945.0				
1053	1052	8				21	0.35	5.98	
1052	1052	1							1 of 3
1065	1064	2	1,750.0		100.0	21	0.35	0.18	
1064	1063	5	1,725.0		850.0				
1064	1063	8				17	0.43	8.44	Weighted C Factor
1063	1060	5	1,475.0		285.0				
1062	1060	8				7	0.79	1.66	
1060	1052	5	1,420.0		1,160.0				
1063	1052	8				21	0.35	14.52	
1052	1052	1							2 of 3
1073	1072	2	1,500.0		100.0	21	0.36	1.77	
1072	1071	5	1,495.0		295.0				
1072	1071	8				17	0.46	6.04	Weighted C Factor
1071	1070	5	1,438.0		600.0				
1071	1070	8				17	0.42	17.57	
1070	1052	5	1,360.0		1,220.0				
1070	1052	8				17	0.38	20.56	Weighted C Factor
1052	1052	1							3 of 3
1052	1051	5	1,080.0		866.0				
1051	1051	11							Add Bank #1
1051	1051	12							Delete Bank #1
1051	1050	5	941.0		1,095.0				
1051	1050	8				21	0.31	46.31	

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Job #:
2469.01A

Date:
October 2006

Run Name:
MERR10-P

			Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Land Use	Runoff Coeff.	Area (ac.)	Comments
1050	1010	5	800.0	675.0	1,570.0				
1050	1010	8				21	0.26	50.1	
1010	1010	10							Bank #1
1049.1	1049	2	1,605.0	1,575.0	100.0	21	0.35	0.15	
1049	1048	5	1,575.0	1,500.0	400.0				
1049	1048	8				21	0.35	2.46	
1048	1044	3	1,497.0	1,477.0	128.0				
1044.1	1044	8				7	0.79	2.9	
1044	1044	1							1 of 2
1047	1046	2	1,500.3	1,497.5	100.0	7	0.79	0.21	
1046	1045	6	1,497.0	1,487.2	400.0	7	0.79	3.32	32' /2%/ 2 Sides
1045	1044	3	1,484.0	1,477.0	385.0				
1045	1044	8				7	0.79	2.21	
1044	1044	1							
1044	1043	3	1,467.9	1,458.0	290.0				
1044	1043	8				7	0.79	3.42	
1043	1042	3	1,457.9	1,443.0	285.0				
1042.1	1042	8				7	0.79	3.84	
1042	1041	3	1,442.9	1,435.0	240.0				
1043	1041	8				7	0.79	2.49	
1041.1	1041	8				7	0.79	5.56	
1041	1040	3	1,434.9	1,400.0	210.0				
1040	1020	5	1,400.0	975.0	1,465.0				
1040	1020	8				21	0.28	22.37	
1020	1020	1							1 of 3
1035	1034	2	1,294.3	1,292.1	100.0	7	0.77	0.12	
1034	1033	6	1,291.6	1,265.0	580.0	7	0.77	3.04	32' /2%/ 2 Sides
1033	1032	3	1,262.0	1,250.0	450.0				
1033	1032	8				7	0.77	1.87	
1032.1	1032	8				7	0.77	2.9	
1032	1031	3	1,249.9	1,248.0	382.0				
1031.1	1031	8				7	0.77	6.6	
1031	1030	3	1,247.9	1,105.0	365.0				
1030	1020	5	1,105.0	975.0	935.0				
1030	1020	8				21	0.26	13.06	
1020	1020	1							2 of 3
1025	1024	2	1,303.4	1,303.0	100.0	7	0.79	0.29	
1024	1023	6	1,302.5	1,295.0	500.0	7	0.78	2.77	
1023	1022	3	1,290.0	1,288.5	290.0				
1022.1	1022	8				7	0.77	2.95	
1022	1021	3	1,288.0	1,125.0	450.0				
1021	1020	5	1,125.0	975.0	665.0				
1021	1020	8				2	0.32	6.44	
1020	1020	1							3 of 3
1020	1010	5	975.0	675.0	2,080.0				

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Job #:
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Date:
October 2006

Run Name:
MERR10-P

			Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Land Use	Runoff Coeff.	Area (ac.)	Comments
1020	1010	8				21	0.26	30.84	
1010	1010	10							Bank #2
1014	1013	2	1,310.9	1,310.5	100.0	7	0.79	0.42	
1013	1012	6	1,310.0	1,304.0	480.0	7	0.79	5.3	
1012	1011	3	1,301.0	1,300.0	125.0				
1011	1010	5	1,300.0	975.0	2,260.0				
1011	1010	8				21	0.27	21.78	
1010	1010	11							Add Bank #1
1010	1010	11							Add Bank #2
1010	1010	12							Delete Bank #1
1010	1010	12							Delete Bank #2
1010	1001	5	975.0	660.0	1,100.0				
1010	1001	8				21	0.28	17.67	
1001	1001	1							1 of 2
1003	1002	2	1,311.0	1,225.0	100.0	21	0.35	0.25	
1002	1001	5	1,225.0	660.0	2,210.0				
1002	1001	8				21	0.27	26.72	
1001	1001	1							2 of 2
1001	10	4	660.0	550.0	760.0				Ex. 42" CSP Caltrans
									Storm Drain
								491.42	Total Area

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

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                        2003,1985,1981 HYDROLOGY MANUAL
       (c) Copyright 1982-2004 Advanced Engineering Software (aes)
           Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                          Analysis prepared by:

                    FUSCOE ENGINEERING - SAN DIEGO, INC.
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                              (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 10 - NO DETENTION ROUTING                                    *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MERR10-P.DAT
  TIME/DATE OF STUDY: 10:53 09/29/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   1087.00 TO NODE   1086.00 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) =   1472.00
  DOWNSTREAM ELEVATION(FEET) =   1467.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.895
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.868
```

```
 SUBAREA RUNOFF(CFS) =      1.47
 TOTAL AREA(ACRES) =      0.61   TOTAL RUNOFF(CFS) =      1.47

****************************************************************************
 FLOW PROCESS FROM NODE   1086.00 TO NODE   1085.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1467.00  DOWNSTREAM(FEET) =   1450.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   305.00   CHANNEL SLOPE =  0.0557
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0557 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      1.47
 FLOW VELOCITY(FEET/SEC) =   1.50 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   3.38   Tc(MIN.) =  11.28
 LONGEST FLOWPATH FROM NODE   1087.00 TO NODE   1085.00 =   405.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1086.00 TO NODE   1085.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.456
 *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) =     2.18   SUBAREA RUNOFF(CFS) =    4.16
 TOTAL AREA(ACRES) =      2.79   TOTAL RUNOFF(CFS) =    5.33
 TC(MIN.) =  11.28

****************************************************************************
 FLOW PROCESS FROM NODE   1085.00 TO NODE   1084.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1450.00  DOWNSTREAM(FEET) =   1322.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   677.00   CHANNEL SLOPE =  0.1891
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1545 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      5.33
 FLOW VELOCITY(FEET/SEC) =   3.84 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.94   Tc(MIN.) =  14.22
 LONGEST FLOWPATH FROM NODE   1087.00 TO NODE   1084.00 =  1082.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1085.00 TO NODE   1084.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.700
 *USER SPECIFIED(SUBAREA):
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .5100
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4690
 SUBAREA AREA(ACRES) =     8.11   SUBAREA RUNOFF(CFS) =   19.44
 TOTAL AREA(ACRES) =     10.90   TOTAL RUNOFF(CFS) =   24.03
 TC(MIN.) =  14.22

****************************************************************************
 FLOW PROCESS FROM NODE   1084.00 TO NODE   1080.00 IS CODE =  53
```



```
 *USER SPECIFIED(SUBAREA):
```

```
------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1322.00  DOWNSTREAM(FEET) =   1165.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   708.00   CHANNEL SLOPE =  0.2218
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1706 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     24.03
  FLOW VELOCITY(FEET/SEC) =   6.67 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.77   Tc(MIN.) =  15.99
  LONGEST FLOWPATH FROM NODE   1087.00 TO NODE   1080.00 =  1790.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1084.00 TO NODE   1080.00 IS CODE =  81
------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.357
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .3900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4174
  SUBAREA AREA(ACRES) =   20.53   SUBAREA RUNOFF(CFS) =   34.89
  TOTAL AREA(ACRES) =     31.43   TOTAL RUNOFF(CFS) =   57.17
  TC(MIN.) =  15.99

****************************************************************************
  FLOW PROCESS FROM NODE   1080.00 TO NODE   1080.00 IS CODE =   1
------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  15.99
  RAINFALL INTENSITY(INCH/HR) =   4.36
  TOTAL STREAM AREA(ACRES) =    31.43
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     57.17

****************************************************************************
  FLOW PROCESS FROM NODE   1083.00 TO NODE   1082.00 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) =   1600.00
  DOWNSTREAM ELEVATION(FEET) =   1513.00
  ELEVATION DIFFERENCE(FEET) =     87.00
  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) =  7.972
  SUBAREA RUNOFF(CFS) =      2.20
  TOTAL AREA(ACRES) =      0.79   TOTAL RUNOFF(CFS) =      2.20

****************************************************************************
  FLOW PROCESS FROM NODE   1082.00 TO NODE   1081.00 IS CODE =  53
------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
========================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   1513.00  DOWNSTREAM(FEET) =   1450.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   628.00   CHANNEL SLOPE =  0.1003
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1002 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      2.20
 FLOW VELOCITY(FEET/SEC) =   2.31 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   4.54   Tc(MIN.) =  10.80
 LONGEST FLOWPATH FROM NODE   1083.00 TO NODE   1081.00 =   728.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1082.00 TO NODE   1081.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.610
 *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) =     3.73   SUBAREA RUNOFF(CFS) =    7.32
 TOTAL AREA(ACRES) =       4.52   TOTAL RUNOFF(CFS) =    8.88
 TC(MIN.) =  10.80

****************************************************************************
 FLOW PROCESS FROM NODE   1081.00 TO NODE   1080.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1450.00  DOWNSTREAM(FEET) =   1165.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1415.00   CHANNEL SLOPE =  0.2014
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1607 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      8.88
 FLOW VELOCITY(FEET/SEC) =   4.64 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   5.08   Tc(MIN.) =  15.88
 LONGEST FLOWPATH FROM NODE   1083.00 TO NODE   1080.00 =  2143.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1081.00 TO NODE   1080.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.376
 *USER SPECIFIED(SUBAREA):
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .3900
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3864
 SUBAREA AREA(ACRES) =    46.31   SUBAREA RUNOFF(CFS) =   79.03
 TOTAL AREA(ACRES) =      50.83   TOTAL RUNOFF(CFS) =   85.96
 TC(MIN.) =  15.88

****************************************************************************
 FLOW PROCESS FROM NODE   1080.00 TO NODE   1080.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  15.88
 RAINFALL INTENSITY(INCH/HR) =   4.38
 TOTAL STREAM AREA(ACRES) =    50.83
```

```
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     85.96

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY       AREA
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)     (ACRE)
     1        57.17     15.99         4.357         31.43
     2        85.96     15.88         4.376         50.83

 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       142.75     15.88       4.376
     2       142.76     15.99       4.357

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    142.76   Tc(MIN.) =   15.99
 TOTAL AREA(ACRES) =     82.26
 LONGEST FLOWPATH FROM NODE   1083.00 TO NODE   1080.00 =  2143.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1080.00 TO NODE   1051.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1165.00  DOWNSTREAM(FEET) =    941.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1200.00   CHANNEL SLOPE =  0.1867
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1533 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =    142.76
 FLOW VELOCITY(FEET/SEC) =  11.44 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.75   Tc(MIN.) =  17.73
 LONGEST FLOWPATH FROM NODE   1083.00 TO NODE   1051.00 =  3343.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1080.00 TO NODE   1051.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.075
 *USER SPECIFIED(SUBAREA):
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .3700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3890
 SUBAREA AREA(ACRES) =   40.16   SUBAREA RUNOFF(CFS) =   60.56
 TOTAL AREA(ACRES) =    122.42   TOTAL RUNOFF(CFS) =  194.07
 TC(MIN.) =  17.73

****************************************************************************
 FLOW PROCESS FROM NODE   1051.00 TO NODE   1051.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   1056.00 TO NODE   1055.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
```

```
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
 S.C.S. CURVE NUMBER (AMC II) =  0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =  100.00
 UPSTREAM ELEVATION(FEET) =  1455.90
 DOWNSTREAM ELEVATION(FEET) =  1455.40
 ELEVATION DIFFERENCE(FEET) =  0.50
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =  4.971
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =  50.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =  1.89
 TOTAL AREA(ACRES) =  0.26  TOTAL RUNOFF(CFS) =  1.89

****************************************************************************
 FLOW PROCESS FROM NODE  1055.00 TO NODE  1054.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1455.00  DOWNSTREAM ELEVATION(FEET) = 1450.00
 STREET LENGTH(FEET) =  425.00  CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 16.00

 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(curb-to-curb) =  0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =  0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =  12.38
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.41
   HALFSTREET FLOOD WIDTH(FEET) =  14.07
   AVERAGE FLOW VELOCITY(FEET/SEC.) =  2.95
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =  1.20
 STREET FLOW TRAVEL TIME(MIN.) =  2.40  Tc(MIN.) =  7.37
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.180
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
 S.C.S. CURVE NUMBER (AMC II) =  0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.790
 SUBAREA AREA(ACRES) =  3.66  SUBAREA RUNOFF(CFS) =  20.76
 TOTAL AREA(ACRES) =  3.92  PEAK FLOW RATE(CFS) =  22.24

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.47  HALFSTREET FLOOD WIDTH(FEET) =  16.00
 FLOW VELOCITY(FEET/SEC.) =  3.54  DEPTH*VELOCITY(FT*FT/SEC.) =  1.68
 LONGEST FLOWPATH FROM NODE  1056.00 TO NODE  1054.00 =  525.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  1054.00 TO NODE  1053.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1447.00  DOWNSTREAM(FEET) =  1410.00
 FLOW LENGTH(FEET) =  220.00  MANNING'S N =  0.013
```

```
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  23.61
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     22.24
 PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =   7.52
 LONGEST FLOWPATH FROM NODE   1056.00 TO NODE   1053.00 =   745.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1053.00 TO NODE   1052.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1410.00  DOWNSTREAM(FEET) =   1080.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   945.00   CHANNEL SLOPE =  0.3492
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .2051 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     22.24
 FLOW VELOCITY(FEET/SEC) =   7.12 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.21   Tc(MIN.) =   9.74
 LONGEST FLOWPATH FROM NODE   1056.00 TO NODE   1052.00 =  1690.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1053.00 TO NODE   1052.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.000
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5242
 SUBAREA AREA(ACRES) =     5.98   SUBAREA RUNOFF(CFS) =   12.56
 TOTAL AREA(ACRES) =      9.90   TOTAL RUNOFF(CFS) =   31.14
 TC(MIN.) =   9.74

****************************************************************************
 FLOW PROCESS FROM NODE   1052.00 TO NODE   1052.00 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.) =   9.74
 RAINFALL INTENSITY(INCH/HR) =   6.00
 TOTAL STREAM AREA(ACRES) =     9.90
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     31.14

****************************************************************************
 FLOW PROCESS FROM NODE   1065.00 TO NODE   1064.00 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) =   1750.00
 DOWNSTREAM ELEVATION(FEET) =   1725.00
 ELEVATION DIFFERENCE(FEET) =     25.00
 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) =  7.972
 SUBAREA RUNOFF(CFS) =      0.50
 TOTAL AREA(ACRES) =      0.18   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
 FLOW PROCESS FROM NODE   1064.00 TO NODE   1063.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1725.00  DOWNSTREAM(FEET) =   1475.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   850.00   CHANNEL SLOPE =  0.2941
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1935 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.50
 FLOW VELOCITY(FEET/SEC) =   2.46 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   5.75   Tc(MIN.) =  12.02
 LONGEST FLOWPATH FROM NODE   1065.00 TO NODE   1063.00 =   950.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1064.00 TO NODE   1063.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.238
 *USER SPECIFIED(SUBAREA):
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .4300
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4283
 SUBAREA AREA(ACRES) =    8.44   SUBAREA RUNOFF(CFS) =   19.01
 TOTAL AREA(ACRES) =      8.62   TOTAL RUNOFF(CFS) =   19.34
 TC(MIN.) =  12.02

****************************************************************************
 FLOW PROCESS FROM NODE   1063.00 TO NODE   1060.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1475.00  DOWNSTREAM(FEET) =   1420.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   285.00   CHANNEL SLOPE =  0.1930
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1565 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     19.34
 FLOW VELOCITY(FEET/SEC) =   5.94 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   0.80   Tc(MIN.) =  12.82
 LONGEST FLOWPATH FROM NODE   1065.00 TO NODE   1060.00 =  1235.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1062.00 TO NODE   1060.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.025
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4867
 SUBAREA AREA(ACRES) =    1.66   SUBAREA RUNOFF(CFS) =    6.59
 TOTAL AREA(ACRES) =     10.28   TOTAL RUNOFF(CFS) =   25.14
 TC(MIN.) =  12.82
```

```
****************************************************************************
 FLOW PROCESS FROM NODE   1060.00 TO NODE   1052.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1420.00  DOWNSTREAM(FEET) =   1080.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1160.00   CHANNEL SLOPE =  0.2931
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1933 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     25.14
 FLOW VELOCITY(FEET/SEC) =   7.20 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.68   Tc(MIN.) =  15.50
 LONGEST FLOWPATH FROM NODE   1065.00 TO NODE   1052.00 =  2395.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1063.00 TO NODE   1052.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.445
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4067
 SUBAREA AREA(ACRES) =   14.52   SUBAREA RUNOFF(CFS) =   22.59
 TOTAL AREA(ACRES) =     24.80   TOTAL RUNOFF(CFS) =   44.83
 TC(MIN.) =  15.50

****************************************************************************
 FLOW PROCESS FROM NODE   1052.00 TO NODE   1052.00 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.) =  15.50
 RAINFALL INTENSITY(INCH/HR) =   4.45
 TOTAL STREAM AREA(ACRES) =    24.80
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     44.83

****************************************************************************
 FLOW PROCESS FROM NODE   1073.00 TO NODE   1072.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3600
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1500.00
 DOWNSTREAM ELEVATION(FEET) =   1495.00
 ELEVATION DIFFERENCE(FEET) =      5.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.790
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.928
 SUBAREA RUNOFF(CFS) =      4.41
 TOTAL AREA(ACRES) =      1.77   TOTAL RUNOFF(CFS) =      4.41

****************************************************************************
 FLOW PROCESS FROM NODE   1072.00 TO NODE   1071.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1495.00  DOWNSTREAM(FEET) =   1438.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   295.00   CHANNEL SLOPE =  0.1932
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1566 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      4.41
  FLOW VELOCITY(FEET/SEC) =   3.63 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.35   Tc(MIN.) =   9.14
  LONGEST FLOWPATH FROM NODE   1073.00 TO NODE   1071.00 =   395.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1072.00 TO NODE   1071.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.248
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .4600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4373
  SUBAREA AREA(ACRES) =    6.04   SUBAREA RUNOFF(CFS) =   17.36
  TOTAL AREA(ACRES) =      7.81   TOTAL RUNOFF(CFS) =   21.34
  TC(MIN.) =   9.14

****************************************************************************
  FLOW PROCESS FROM NODE   1071.00 TO NODE   1070.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1438.00  DOWNSTREAM(FEET) =   1360.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.1300
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1217 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     21.34
  FLOW VELOCITY(FEET/SEC) =   5.41 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.85   Tc(MIN.) =  10.99
  LONGEST FLOWPATH FROM NODE   1073.00 TO NODE   1070.00 =   995.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1071.00 TO NODE   1070.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.549
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .4200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4253
  SUBAREA AREA(ACRES) =   17.57   SUBAREA RUNOFF(CFS) =   40.95
  TOTAL AREA(ACRES) =     25.38   TOTAL RUNOFF(CFS) =   59.90
  TC(MIN.) =  10.99

****************************************************************************
  FLOW PROCESS FROM NODE   1070.00 TO NODE   1052.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1360.00  DOWNSTREAM(FEET) =   1080.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1220.00   CHANNEL SLOPE =  0.2295
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1732 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
```

```
 CHANNEL FLOW THRU SUBAREA(CFS) =     59.90
 FLOW VELOCITY(FEET/SEC) =   9.11 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.23   Tc(MIN.) =  13.22
 LONGEST FLOWPATH FROM NODE   1073.00 TO NODE   1052.00 =  2215.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1070.00 TO NODE   1052.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.925
 *USER SPECIFIED(SUBAREA):
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .3800
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4050
 SUBAREA AREA(ACRES) =   20.56   SUBAREA RUNOFF(CFS) =   38.47
 TOTAL AREA(ACRES) =     45.94   TOTAL RUNOFF(CFS) =   91.64
 TC(MIN.) =  13.22

****************************************************************************
 FLOW PROCESS FROM NODE   1052.00 TO NODE   1052.00 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.) =  13.22
 RAINFALL INTENSITY(INCH/HR) =   4.92
 TOTAL STREAM AREA(ACRES) =    45.94
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     91.64

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc       INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
     1       31.14      9.74         6.000         9.90
     2       44.83     15.50         4.445        24.80
     3       91.64     13.22         4.925        45.94

 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      126.76      9.74         6.000
     2      155.44     13.22         4.925
     3      150.61     15.50         4.445

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    155.44   Tc(MIN.) =   13.22
 TOTAL AREA(ACRES) =     80.64
 LONGEST FLOWPATH FROM NODE   1065.00 TO NODE   1052.00 =  2395.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1052.00 TO NODE   1051.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1080.00  DOWNSTREAM(FEET) =    941.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   866.00   CHANNEL SLOPE =  0.1605
 SLOPE ADJUSTMENT CURVE USED:
```

```
 EFFECTIVE SLOPE = .1403 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =    155.44
 FLOW VELOCITY(FEET/SEC) =  11.26 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.28   Tc(MIN.) =  14.51
 LONGEST FLOWPATH FROM NODE   1065.00 TO NODE   1051.00 =  3261.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1051.00 TO NODE   1051.00 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       155.44    14.51        4.639       80.64
 LONGEST FLOWPATH FROM NODE   1065.00 TO NODE   1051.00 =  3261.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc       INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)    (INCH/HOUR)   (ACRE)
    1       194.07    17.73        4.075      122.42
 LONGEST FLOWPATH FROM NODE   1083.00 TO NODE   1051.00 =  3343.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF        Tc       INTENSITY
 NUMBER     (CFS)      (MIN.)    (INCH/HOUR)
    1      314.18       14.51        4.639
    2      330.62       17.73        4.075

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    330.62   Tc(MIN.) =   17.73
 TOTAL AREA(ACRES) =    203.06

****************************************************************************
 FLOW PROCESS FROM NODE   1051.00 TO NODE   1051.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   1051.00 TO NODE   1050.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    941.00  DOWNSTREAM(FEET) =    800.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1095.00   CHANNEL SLOPE =  0.1288
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1208 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =    330.62
 FLOW VELOCITY(FEET/SEC) =  13.43 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.36   Tc(MIN.) =  19.09
 LONGEST FLOWPATH FROM NODE   1083.00 TO NODE   1050.00 =  4438.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1051.00 TO NODE   1050.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.886
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3100
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3844
  SUBAREA AREA(ACRES) =   46.31   SUBAREA RUNOFF(CFS) =   55.79
  TOTAL AREA(ACRES) =    249.37   TOTAL RUNOFF(CFS) =  372.50
  TC(MIN.) =  19.09

****************************************************************************
  FLOW PROCESS FROM NODE   1050.00 TO NODE   1010.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    800.00  DOWNSTREAM(FEET) =    675.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1570.00   CHANNEL SLOPE =  0.0796
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0796 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    372.50
  FLOW VELOCITY(FEET/SEC) =  11.35 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.31   Tc(MIN.) =  21.40
  LONGEST FLOWPATH FROM NODE   1083.00 TO NODE   1010.00 =  6008.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1050.00 TO NODE   1010.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.610
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3636
  SUBAREA AREA(ACRES) =   50.10   SUBAREA RUNOFF(CFS) =   47.03
  TOTAL AREA(ACRES) =    299.47   TOTAL RUNOFF(CFS) =  393.11
  TC(MIN.) =  21.40

****************************************************************************
  FLOW PROCESS FROM NODE   1010.00 TO NODE   1010.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1049.10 TO NODE   1049.00 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) =   1605.00
  DOWNSTREAM ELEVATION(FEET) =   1575.00
  ELEVATION DIFFERENCE(FEET) =     30.00
  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) =  7.972
  SUBAREA RUNOFF(CFS) =      0.42
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.42

****************************************************************************
  FLOW PROCESS FROM NODE   1049.00 TO NODE   1048.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1575.00  DOWNSTREAM(FEET) =   1500.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   400.00   CHANNEL SLOPE =  0.1875
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1538 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.42
  FLOW VELOCITY(FEET/SEC) =   2.20 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.04   Tc(MIN.) =   9.30
  LONGEST FLOWPATH FROM NODE   1049.10 TO NODE   1048.00 =   500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1049.00 TO NODE   1048.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.179
  *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) =     2.46   SUBAREA RUNOFF(CFS) =    5.32
  TOTAL AREA(ACRES) =       2.61   TOTAL RUNOFF(CFS) =    5.64
  TC(MIN.) =   9.30

****************************************************************************
  FLOW PROCESS FROM NODE   1048.00 TO NODE   1044.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1497.00  DOWNSTREAM(FEET) =  1477.00
  FLOW LENGTH(FEET) =   128.00   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.) =  15.83
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      5.64
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =   9.44
  LONGEST FLOWPATH FROM NODE   1049.10 TO NODE   1044.00 =   628.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1044.10 TO NODE   1044.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.122
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5816
  SUBAREA AREA(ACRES) =     2.90   SUBAREA RUNOFF(CFS) =   14.02
  TOTAL AREA(ACRES) =       5.51   TOTAL RUNOFF(CFS) =   19.62
  TC(MIN.) =   9.44

****************************************************************************
  FLOW PROCESS FROM NODE   1044.00 TO NODE   1044.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =    9.44
  RAINFALL INTENSITY(INCH/HR) =    6.12
  TOTAL STREAM AREA(ACRES) =      5.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      19.62

****************************************************************************
  FLOW PROCESS FROM NODE    1047.00 TO NODE    1046.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =    0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    100.00
  UPSTREAM ELEVATION(FEET) =    1500.30
  DOWNSTREAM ELEVATION(FEET) =    1497.50
  ELEVATION DIFFERENCE(FEET) =       2.80
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =     3.714
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =     88.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =       1.53
  TOTAL AREA(ACRES) =      0.21   TOTAL RUNOFF(CFS) =       1.53

****************************************************************************
  FLOW PROCESS FROM NODE    1046.00 TO NODE    1045.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1497.00  DOWNSTREAM ELEVATION(FEET) = 1487.20
  STREET LENGTH(FEET) =    400.00    CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 16.00

  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(curb-to-curb) =    0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =    0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       13.06
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.37
    HALFSTREET FLOOD WIDTH(FEET) =    12.35
    AVERAGE FLOW VELOCITY(FEET/SEC.) =     3.97
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =     1.48
  STREET FLOW TRAVEL TIME(MIN.) =    1.68   Tc(MIN.) =    5.39
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.784
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =    0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.790
  SUBAREA AREA(ACRES) =     3.32      SUBAREA RUNOFF(CFS) =    23.04
  TOTAL AREA(ACRES) =       3.53        PEAK FLOW RATE(CFS) =       24.50

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.45   HALFSTREET FLOOD WIDTH(FEET) =  15.96
```

```
 FLOW VELOCITY(FEET/SEC.) =  4.60   DEPTH*VELOCITY(FT*FT/SEC.) =   2.05
 LONGEST FLOWPATH FROM NODE   1047.00 TO NODE   1045.00 =   500.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1045.00 TO NODE   1044.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1484.00  DOWNSTREAM(FEET) =  1477.00
 FLOW LENGTH(FEET) =   385.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.33
 ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     24.50
 PIPE TRAVEL TIME(MIN.) =   0.62    Tc(MIN.) =   6.01
 LONGEST FLOWPATH FROM NODE   1047.00 TO NODE   1044.00 =   885.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1045.00 TO NODE   1044.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.188
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7900
 SUBAREA AREA(ACRES) =    2.21   SUBAREA RUNOFF(CFS) =   14.29
 TOTAL AREA(ACRES) =      5.74   TOTAL RUNOFF(CFS) =   37.13
 TC(MIN.) =   6.01

****************************************************************************
 FLOW PROCESS FROM NODE   1044.00 TO NODE   1044.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   6.01
 RAINFALL INTENSITY(INCH/HR) =   8.19
 TOTAL STREAM AREA(ACRES) =     5.74
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     37.13

 ** CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY      AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1       19.62     9.44        6.122         5.51
     2       37.13     6.01        8.188         5.74

 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       49.62     6.01        8.188
     2       47.37     9.44        6.122

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     49.62   Tc(MIN.) =    6.01
 TOTAL AREA(ACRES) =     11.25
```



```
*USER SPECIFIED(SUBAREA):
```

```
 LONGEST FLOWPATH FROM NODE   1047.00 TO NODE   1044.00 =   885.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1044.00 TO NODE   1043.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1467.90  DOWNSTREAM(FEET) =  1458.00
 FLOW LENGTH(FEET) =   290.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  15.48
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     49.62
 PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =   6.32
 LONGEST FLOWPATH FROM NODE   1047.00 TO NODE   1043.00 =  1175.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1044.00 TO NODE   1043.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.925
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7117
 SUBAREA AREA(ACRES) =    3.42   SUBAREA RUNOFF(CFS) =   21.41
 TOTAL AREA(ACRES) =     14.67   TOTAL RUNOFF(CFS) =   82.74
 TC(MIN.) =   6.32

****************************************************************************
 FLOW PROCESS FROM NODE   1043.00 TO NODE   1042.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1457.90  DOWNSTREAM(FEET) =  1443.00
 FLOW LENGTH(FEET) =   285.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  30.0 INCH PIPE IS  22.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  20.59
 ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     82.74
 PIPE TRAVEL TIME(MIN.) =   0.23    Tc(MIN.) =   6.56
 LONGEST FLOWPATH FROM NODE   1047.00 TO NODE   1042.00 =  1460.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1042.10 TO NODE   1042.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.744
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7280
 SUBAREA AREA(ACRES) =    3.84   SUBAREA RUNOFF(CFS) =   23.49
 TOTAL AREA(ACRES) =     18.51   TOTAL RUNOFF(CFS) =  104.34
 TC(MIN.) =   6.56

****************************************************************************
 FLOW PROCESS FROM NODE   1042.00 TO NODE   1041.00 IS CODE =  31
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1442.90  DOWNSTREAM(FEET) =  1435.00
  FLOW LENGTH(FEET) =   240.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  26.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.40
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    104.34
  PIPE TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =   6.77
  LONGEST FLOWPATH FROM NODE   1047.00 TO NODE   1041.00 =  1700.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1043.00 TO NODE   1041.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.582
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7353
  SUBAREA AREA(ACRES) =    2.49   SUBAREA RUNOFF(CFS) =   14.92
  TOTAL AREA(ACRES) =     21.00   TOTAL RUNOFF(CFS) =  117.08
  TC(MIN.) =   6.77

****************************************************************************
  FLOW PROCESS FROM NODE   1041.10 TO NODE   1041.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.582
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7468
  SUBAREA AREA(ACRES) =    5.56   SUBAREA RUNOFF(CFS) =   33.30
  TOTAL AREA(ACRES) =     26.56   TOTAL RUNOFF(CFS) =  150.39
  TC(MIN.) =   6.77

****************************************************************************
  FLOW PROCESS FROM NODE   1041.00 TO NODE   1040.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1434.90  DOWNSTREAM(FEET) =  1400.00
  FLOW LENGTH(FEET) =   210.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  23.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  36.77
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    150.39
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =   6.87
  LONGEST FLOWPATH FROM NODE   1047.00 TO NODE   1040.00 =  1910.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1040.00 TO NODE   1020.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1400.00  DOWNSTREAM(FEET) =    975.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1465.00   CHANNEL SLOPE =  0.2901
```

```
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1925 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    150.39
  FLOW VELOCITY(FEET/SEC) =  13.05 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.87   Tc(MIN.) =   8.74
  LONGEST FLOWPATH FROM NODE   1047.00 TO NODE   1020.00 =  3375.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1040.00 TO NODE   1020.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.433
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5334
  SUBAREA AREA(ACRES) =   22.37   SUBAREA RUNOFF(CFS) =   40.29
  TOTAL AREA(ACRES) =     48.93   TOTAL RUNOFF(CFS) =  167.87
  TC(MIN.) =   8.74

****************************************************************************
  FLOW PROCESS FROM NODE   1020.00 TO NODE   1020.00 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.) =   8.74
  RAINFALL INTENSITY(INCH/HR) =   6.43
  TOTAL STREAM AREA(ACRES) =    48.93
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    167.87

****************************************************************************
  FLOW PROCESS FROM NODE   1035.00 TO NODE   1034.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1294.30
  DOWNSTREAM ELEVATION(FEET) =   1292.10
  ELEVATION DIFFERENCE(FEET) =      2.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.136
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    82.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.85
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.85

****************************************************************************
  FLOW PROCESS FROM NODE   1034.00 TO NODE   1033.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1291.60  DOWNSTREAM ELEVATION(FEET) = 1265.00
  STREET LENGTH(FEET) =   580.00   CURB HEIGHT(INCHES) =  6.0
```

```
  STREET HALFWIDTH(FEET) = 16.00

  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(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.33
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.32
    HALFSTREET FLOOD WIDTH(FEET) =    9.86
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.74
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.53
  STREET FLOW TRAVEL TIME(MIN.) =   2.04   Tc(MIN.) =   6.18
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.048
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.770
  SUBAREA AREA(ACRES) =     3.04      SUBAREA RUNOFF(CFS) =   18.84
  TOTAL AREA(ACRES) =       3.16        PEAK FLOW RATE(CFS) =      19.58

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) =  12.86
  FLOW VELOCITY(FEET/SEC.) =  5.52   DEPTH*VELOCITY(FT*FT/SEC.) =   2.12
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1033.00 =   680.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1033.00 TO NODE   1032.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1262.00  DOWNSTREAM(FEET) =  1250.00
  FLOW LENGTH(FEET) =   450.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.33
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     19.58
  PIPE TRAVEL TIME(MIN.) =   0.66    Tc(MIN.) =   6.84
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1032.00 =  1130.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1033.00 TO NODE   1032.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.536
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7700
  SUBAREA AREA(ACRES) =     1.87   SUBAREA RUNOFF(CFS) =   10.85
  TOTAL AREA(ACRES) =       5.03   TOTAL RUNOFF(CFS) =   29.19
  TC(MIN.) =   6.84

****************************************************************************
  FLOW PROCESS FROM NODE   1032.10 TO NODE   1032.00 IS CODE =  81
----------------------------------------------------------------------------
```

```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.536
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7700
  SUBAREA AREA(ACRES) =     2.90   SUBAREA RUNOFF(CFS) =   16.83
  TOTAL AREA(ACRES) =       7.93   TOTAL RUNOFF(CFS) =   46.02
  TC(MIN.) =   6.84

********************************************************************************
  FLOW PROCESS FROM NODE   1032.00 TO NODE   1031.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1249.90  DOWNSTREAM(FEET) =  1248.00
  FLOW LENGTH(FEET) =   382.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.45
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     46.02
  PIPE TRAVEL TIME(MIN.) =   0.85    Tc(MIN.) =   7.69
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1031.00 =  1512.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE   1031.10 TO NODE   1031.00 IS CODE =  81
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.985
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7700
  SUBAREA AREA(ACRES) =     6.60   SUBAREA RUNOFF(CFS) =   35.50
  TOTAL AREA(ACRES) =      14.53   TOTAL RUNOFF(CFS) =   78.15
  TC(MIN.) =   7.69

********************************************************************************
  FLOW PROCESS FROM NODE   1031.00 TO NODE   1030.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1247.90  DOWNSTREAM(FEET) =  1105.00
  FLOW LENGTH(FEET) =   365.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  43.73
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     78.15
  PIPE TRAVEL TIME(MIN.) =   0.14    Tc(MIN.) =   7.83
  LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1030.00 =  1877.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE   1030.00 TO NODE   1020.00 IS CODE =  53
--------------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1105.00  DOWNSTREAM(FEET) =    975.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   935.00   CHANNEL SLOPE =  0.1390
```

```
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1277 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     78.15
 FLOW VELOCITY(FEET/SEC) =   8.54 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.82   Tc(MIN.) =   9.65
 LONGEST FLOWPATH FROM NODE   1035.00 TO NODE   1020.00 =  2812.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1030.00 TO NODE   1020.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.032
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5286
 SUBAREA AREA(ACRES) =   13.06   SUBAREA RUNOFF(CFS) =   20.48
 TOTAL AREA(ACRES) =     27.59   TOTAL RUNOFF(CFS) =   87.97
 TC(MIN.) =   9.65

****************************************************************************
 FLOW PROCESS FROM NODE   1020.00 TO NODE   1020.00 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.) =   9.65
 RAINFALL INTENSITY(INCH/HR) =   6.03
 TOTAL STREAM AREA(ACRES) =    27.59
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     87.97

****************************************************************************
 FLOW PROCESS FROM NODE   1025.00 TO NODE   1024.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1303.40
 DOWNSTREAM ELEVATION(FEET) =   1303.00
 ELEVATION DIFFERENCE(FEET) =      0.40
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.971
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    50.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      2.11
 TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      2.11

****************************************************************************
 FLOW PROCESS FROM NODE   1024.00 TO NODE   1023.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1302.50  DOWNSTREAM ELEVATION(FEET) = 1295.00
 STREET LENGTH(FEET) =   500.00   CURB HEIGHT(INCHES) =  6.0
```

```
 STREET HALFWIDTH(FEET) = 16.00

 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(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.75
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.37
   HALFSTREET FLOOD WIDTH(FEET) =   12.18
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.05
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.13
 STREET FLOW TRAVEL TIME(MIN.) =   2.74   Tc(MIN.) =   7.71
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.976
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7800
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.781
 SUBAREA AREA(ACRES) =     2.77      SUBAREA RUNOFF(CFS) =   15.07
 TOTAL AREA(ACRES) =       3.06        PEAK FLOW RATE(CFS) =      16.67

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.43   HALFSTREET FLOOD WIDTH(FEET) =  15.10
 FLOW VELOCITY(FEET/SEC.) =  3.48   DEPTH*VELOCITY(FT*FT/SEC.) =   1.49
 LONGEST FLOWPATH FROM NODE   1025.00 TO NODE   1023.00 =   600.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1023.00 TO NODE   1022.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1290.00  DOWNSTREAM(FEET) =  1288.50
 FLOW LENGTH(FEET) =   290.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.89
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     16.67
 PIPE TRAVEL TIME(MIN.) =   0.82    Tc(MIN.) =   8.53
 LONGEST FLOWPATH FROM NODE   1025.00 TO NODE   1022.00 =   890.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1022.10 TO NODE   1022.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.535
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7756
 SUBAREA AREA(ACRES) =     2.95   SUBAREA RUNOFF(CFS) =   14.84
 TOTAL AREA(ACRES) =       6.01   TOTAL RUNOFF(CFS) =   30.46
 TC(MIN.) =   8.53

****************************************************************************
 FLOW PROCESS FROM NODE   1022.00 TO NODE   1021.00 IS CODE =  31
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1288.00  DOWNSTREAM(FEET) =  1125.00
  FLOW LENGTH(FEET) =   450.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  34.07
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     30.46
  PIPE TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =   8.75
  LONGEST FLOWPATH FROM NODE   1025.00 TO NODE   1021.00 =  1340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1021.00 TO NODE   1020.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1125.00  DOWNSTREAM(FEET) =    975.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   665.00   CHANNEL SLOPE =  0.2256
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1719 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =     30.46
  FLOW VELOCITY(FEET/SEC) =   7.24 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.53   Tc(MIN.) =  10.28
  LONGEST FLOWPATH FROM NODE   1025.00 TO NODE   1020.00 =  2005.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1021.00 TO NODE   1020.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.794
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .3200
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5399
  SUBAREA AREA(ACRES) =    6.44   SUBAREA RUNOFF(CFS) =   11.94
  TOTAL AREA(ACRES) =     12.45   TOTAL RUNOFF(CFS) =   38.95
  TC(MIN.) =  10.28

****************************************************************************
  FLOW PROCESS FROM NODE   1020.00 TO NODE   1020.00 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.) =  10.28
  RAINFALL INTENSITY(INCH/HR) =   5.79
  TOTAL STREAM AREA(ACRES) =    12.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     38.95

  ** CONFLUENCE DATA **
  STREAM      RUNOFF       Tc       INTENSITY       AREA
  NUMBER       (CFS)     (MIN.)    (INCH/HOUR)     (ACRE)
      1       167.87      8.74         6.433         48.93
      2        87.97      9.65         6.032         27.59
      3        38.95     10.28         5.794         12.45

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
```

CONFLUENCE FORMULA USED FOR 3 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	280.63	8.74	6.433
2	281.99	9.65	6.032
3	274.65	10.28	5.794

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 281.99 Tc(MIN.) = 9.65
TOTAL AREA(ACRES) = 88.97
LONGEST FLOWPATH FROM NODE 1047.00 TO NODE 1020.00 = 3375.00 FEET.

****
FLOW PROCESS FROM NODE 1020.00 TO NODE 1010.00 IS CODE = 53

>>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 975.00 DOWNSTREAM(FEET) = 675.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 2080.00 CHANNEL SLOPE = 0.1442
SLOPE ADJUSTMENT CURVE USED:
EFFECTIVE SLOPE = .1312 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
CHANNEL FLOW THRU SUBAREA(CFS) = 281.99
FLOW VELOCITY(FEET/SEC) = 13.27 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
TRAVEL TIME(MIN.) = 2.61 Tc(MIN.) = 12.27
LONGEST FLOWPATH FROM NODE 1047.00 TO NODE 1010.00 = 5455.00 FEET.

****
FLOW PROCESS FROM NODE 1020.00 TO NODE 1010.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.169
*USER SPECIFIED(SUBAREA):
NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.4626
SUBAREA AREA(ACRES) = 30.84 SUBAREA RUNOFF(CFS) = 41.45
TOTAL AREA(ACRES) = 119.81 TOTAL RUNOFF(CFS) = 286.48
TC(MIN.) = 12.27

****
FLOW PROCESS FROM NODE 1010.00 TO NODE 1010.00 IS CODE = 10

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

****
FLOW PROCESS FROM NODE 1014.00 TO NODE 1013.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==
*USER SPECIFIED(SUBAREA):
RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
S.C.S. CURVE NUMBER (AMC II) = 0
INITIAL SUBAREA FLOW-LENGTH(FEET) = 100.00
UPSTREAM ELEVATION(FEET) = 1310.90
DOWNSTREAM ELEVATION(FEET) = 1310.50
ELEVATION DIFFERENCE(FEET) = 0.40
SUBAREA OVERLAND TIME OF FLOW(MIN.) = 4.971
WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN

```
          THE MAXIMUM OVERLAND FLOW LENGTH =    50.00
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.222
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) =      3.06
TOTAL AREA(ACRES) =      0.42   TOTAL RUNOFF(CFS) =      3.06

****************************************************************************
 FLOW PROCESS FROM NODE   1013.00 TO NODE   1012.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1310.00  DOWNSTREAM ELEVATION(FEET) = 1304.00
 STREET LENGTH(FEET) =   480.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 16.00

 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(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.36
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.45
   HALFSTREET FLOOD WIDTH(FEET) =   16.00
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.34
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.51
 STREET FLOW TRAVEL TIME(MIN.) =   2.39   Tc(MIN.) =   7.37
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.183
 *USER SPECIFIED(SUBAREA):
 RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.790
 SUBAREA AREA(ACRES) =     5.30      SUBAREA RUNOFF(CFS) =   30.08
 TOTAL AREA(ACRES) =       5.72        PEAK FLOW RATE(CFS) =      32.46

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.52   HALFSTREET FLOOD WIDTH(FEET) =  17.01
 FLOW VELOCITY(FEET/SEC.) =  4.19   DEPTH*VELOCITY(FT*FT/SEC.) =   2.18
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  480.0 FT WITH ELEVATION-DROP =   6.0 FT, IS   38.6 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   1012.00
 LONGEST FLOWPATH FROM NODE   1014.00 TO NODE   1012.00 =   580.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1012.00 TO NODE   1011.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1301.00  DOWNSTREAM(FEET) =  1300.00
 FLOW LENGTH(FEET) =   125.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  30.0 INCH PIPE IS  23.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.06
 ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     32.46
```

```
 PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =   7.62
 LONGEST FLOWPATH FROM NODE   1014.00 TO NODE   1011.00 =   705.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1011.00 TO NODE   1010.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1300.00  DOWNSTREAM(FEET) =    975.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2260.00   CHANNEL SLOPE =  0.1438
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1309 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     32.46
 FLOW VELOCITY(FEET/SEC) =   6.45 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   5.84   Tc(MIN.) =  13.46
 LONGEST FLOWPATH FROM NODE   1014.00 TO NODE   1010.00 =  2965.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1011.00 TO NODE   1010.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.869
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3782
 SUBAREA AREA(ACRES) =   21.78   SUBAREA RUNOFF(CFS) =   28.63
 TOTAL AREA(ACRES) =     27.50   TOTAL RUNOFF(CFS) =   50.63
 TC(MIN.) =  13.46

****************************************************************************
 FLOW PROCESS FROM NODE   1010.00 TO NODE   1010.00 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        50.63     13.46        4.869       27.50
 LONGEST FLOWPATH FROM NODE   1014.00 TO NODE   1010.00 =  2965.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc       INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)    (INCH/HOUR)   (ACRE)
    1       393.11     21.40        3.610      299.47
 LONGEST FLOWPATH FROM NODE   1083.00 TO NODE   1010.00 =  6008.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc       INTENSITY
 NUMBER     (CFS)     (MIN.)    (INCH/HOUR)
    1      297.89      13.46         4.869
    2      430.66      21.40         3.610

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    430.66   Tc(MIN.) =   21.40
 TOTAL AREA(ACRES) =    326.97

****************************************************************************
 FLOW PROCESS FROM NODE   1010.00 TO NODE   1010.00 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       430.66     21.40        3.610       326.97
  LONGEST FLOWPATH FROM NODE   1083.00 TO NODE   1010.00 =  6008.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM      RUNOFF      Tc       INTENSITY      AREA
  NUMBER       (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
      1       286.48     12.27        5.169       119.81
  LONGEST FLOWPATH FROM NODE   1047.00 TO NODE   1010.00 =  5455.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc       INTENSITY
  NUMBER      (CFS)     (MIN.)    (INCH/HOUR)
      1      533.35      12.27        5.169
      2      630.75      21.40        3.610

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    630.75   Tc(MIN.) =   21.40
  TOTAL AREA(ACRES) =    446.78

********************************************************************************
  FLOW PROCESS FROM NODE   1010.00 TO NODE   1010.00 IS CODE =  12
--------------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
================================================================================

********************************************************************************
  FLOW PROCESS FROM NODE   1010.00 TO NODE   1010.00 IS CODE =  12
--------------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
================================================================================

********************************************************************************
  FLOW PROCESS FROM NODE   1010.00 TO NODE   1001.00 IS CODE =  53
--------------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    975.00  DOWNSTREAM(FEET) =    660.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1100.00   CHANNEL SLOPE =  0.2864
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1916 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    630.75
  FLOW VELOCITY(FEET/SEC) =  20.98 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.87   Tc(MIN.) =  22.27
  LONGEST FLOWPATH FROM NODE   1083.00 TO NODE   1001.00 =  7108.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE   1010.00 TO NODE   1001.00 IS CODE =  81
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.518
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2800
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3868
  SUBAREA AREA(ACRES) =   17.67   SUBAREA RUNOFF(CFS) =   17.41
```

```
 TOTAL AREA(ACRES) =    464.45   TOTAL RUNOFF(CFS) =  632.08
 TC(MIN.) =  22.27

****************************************************************************
 FLOW PROCESS FROM NODE   1001.00 TO NODE   1001.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  22.27
 RAINFALL INTENSITY(INCH/HR) =   3.52
 TOTAL STREAM AREA(ACRES) =   464.45
 PEAK FLOW RATE(CFS) AT CONFLUENCE =    632.08

****************************************************************************
 FLOW PROCESS FROM NODE   1003.00 TO NODE   1002.00 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) =   1311.00
 DOWNSTREAM ELEVATION(FEET) =   1225.00
 ELEVATION DIFFERENCE(FEET) =     86.00
 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) =  7.972
 SUBAREA RUNOFF(CFS) =      0.70
 TOTAL AREA(ACRES) =      0.25   TOTAL RUNOFF(CFS) =      0.70

****************************************************************************
 FLOW PROCESS FROM NODE   1002.00 TO NODE   1001.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1225.00  DOWNSTREAM(FEET) =    660.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2210.00   CHANNEL SLOPE =  0.2557
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1819 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.70
 FLOW VELOCITY(FEET/SEC) =   2.39 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =  15.42   Tc(MIN.) =  21.69
 LONGEST FLOWPATH FROM NODE   1003.00 TO NODE   1001.00 =  2310.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1002.00 TO NODE   1001.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.579
 *USER SPECIFIED(SUBAREA):
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2700
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2707
 SUBAREA AREA(ACRES) =   26.72   SUBAREA RUNOFF(CFS) =   25.82
 TOTAL AREA(ACRES) =     26.97   TOTAL RUNOFF(CFS) =   26.13
 TC(MIN.) =  21.69
```

```
**************************************************************************
 FLOW PROCESS FROM NODE   1001.00 TO NODE   1001.00 IS CODE =   1
--------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==========================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  21.69
 RAINFALL INTENSITY(INCH/HR) =   3.58
 TOTAL STREAM AREA(ACRES) =    26.97
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     26.13

 ** CONFLUENCE DATA **
 STREAM     RUNOFF      Tc       INTENSITY      AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
    1       632.08    22.27        3.518        464.45
    2        26.13    21.69        3.579         26.97

 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       641.65    21.69        3.579
    2       657.77    22.27        3.518

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =    657.77   Tc(MIN.) =   22.27
 TOTAL AREA(ACRES) =    491.42
 LONGEST FLOWPATH FROM NODE   1083.00 TO NODE   1001.00 =  7108.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE   1001.00 TO NODE     10.00 IS CODE =  41
--------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   660.00  DOWNSTREAM(FEET) =   550.00
 FLOW LENGTH(FEET) =   760.00   MANNING'S N =  0.015
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) =  36.07
 (PIPE FLOW VELOCITY CORRESPONDING TO NORMAL-DEPTH FLOW
  AT DEPTH = 0.94 * DIAMETER)
 GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    657.77
 PIPE TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =  22.62
 LONGEST FLOWPATH FROM NODE   1083.00 TO NODE     10.00 =  7868.00 FEET.
==========================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =    491.42  TC(MIN.) =     22.62
 PEAK FLOW RATE(CFS)   =    657.77
==========================================================================
==========================================================================
 END OF RATIONAL METHOD ANALYSIS
```

RATIONAL METHOD HYDROGRAPH PROGRAM
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RUN DATE 9/29/2006
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 23 MIN.
6 H ' RAINFALL 3.5 INCHES
BA AREA 491.42 ACRES
RUNOFF COEFFICIENT 0.38
PEAK DISCHARGE 657.77 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 23	DISCHARGE (CFS) = 0
TIME (MIN) = 46	DISCHARGE (CFS) = 40.7
TIME (MIN) = 69	DISCHARGE (CFS) = 42.6
TIME (MIN) = 92	DISCHARGE (CFS) = 47.3
TIME (MIN) = 115	DISCHARGE (CFS) = 50.2
TIME (MIN) = 138	DISCHARGE (CFS) = 57.5
TIME (MIN) = 161	DISCHARGE (CFS) = 62.3
TIME (MIN) = 184	DISCHARGE (CFS) = 76.2
TIME (MIN) = 207	DISCHARGE (CFS) = 86.8
TIME (MIN) = 230	DISCHARGE (CFS) = 127.4
TIME (MIN) = 253	DISCHARGE (CFS) = 165.3
TIME (MIN) = 276	DISCHARGE (CFS) = 657.77
TIME (MIN) = 299	DISCHARGE (CFS) = 102.2
TIME (MIN) = 322	DISCHARGE (CFS) = 68.4
TIME (MIN) = 345	DISCHARGE (CFS) = 53.5
TIME (MIN) = 368	DISCHARGE (CFS) = 44.8
TIME (MIN) = 391	DISCHARGE (CFS) = 0

```
**************************************************************************
                HYDRAULICS ELEMENTS - II  PROGRAM PACKAGE

                STORAGE BASIN HYDROGRAPH ROUTING MODEL
**************************************************************************
        (c) Copyright 1983-2004 Advanced Engineering Software (aes)
            Ver. 10.0  Release Date: 01/01/2004  License ID 1355

                          Analysis prepared by:

                   FUSCOE ENGINEERING - SAN DIEGO, INC.
                     6390 GREENWICH DRIVE, SUITE 170
                       SAN DIEGO, CALIFORNIA 92122
                             (858) 554-1500

 ************************* DESCRIPTION OF STUDY *************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                 *
* SUBBASIN # 10 - EXISTING DETENTION STORAGE ROUTING                     *
* 2469.01A - OCTOBER 2006                                                *
 **************************************************************************

    FILE NAME: MMDET10P.DAT
    TIME/DATE OF STUDY: 11:07 09/29/2006
==========================================================================
    ENTERED INFORMATION:
--------------------------------------------------------------------------
    TOTAL NUMBER OF INFLOW HYDROGRAPH INTERVALS =   18
    CONSTANT HYDROGRAPH TIME UNIT(MINUTES) =   23.000
    ASSUMED INITIAL DEPTH(FEET) IN STORAGE BASIN =    0.00
--------------------------------------------------------------------------
    ENTERED INFLOW HYDROGRAPH ORDINATES(CFS):
    *INTERVAL    FLOW    *INTERVAL    FLOW    *INTERVAL    FLOW    *
    * NUMBER     (CFS)   * NUMBER     (CFS)   * NUMBER     (CFS)   *
    *    1:        0.00*    2:        0.00*    3:       40.70*
    *    4:       42.60*    5:       47.30*    6:       50.20*
    *    7:       57.50*    8:       62.30*    9:       76.20*
    *   10:       86.80*   11:      127.40*   12:      165.30*
    *   13:      657.77*   14:      102.20*   15:       68.40*
    *   16:       53.50*   17:       44.80*   18:        0.00*
==========================================================================
    DEPTH-VS.-STORAGE AND DEPTH-VS.-DISCHARGE INFORMATION:
--------------------------------------------------------------------------
    TOTAL NUMBER OF BASIN DEPTH INFORMATION ENTRIES =   4
--------------------------------------------------------------------------
    *BASIN-DEPTH  STORAGE    OUTFLOW  **BASIN-DEPTH  STORAGE    OUTFLOW  *
    *   (FEET)  (ACRE-FEET)   (CFS)   **   (FEET)  (ACRE-FEET)   (CFS)   *
    *     0.000      0.000     0.000**     5.000     13.600     60.000*
    *    10.000     32.800   100.000**    15.000     56.500    130.000*
**************************************************************************
--------------------------------------------------------------------------
    INITIAL BASIN DEPTH(FEET) =    0.00
    INITIAL BASIN STORAGE(ACRE-FEET) =       0.00
    INITIAL BASIN OUTFLOW(CFS) =       0.00
--------------------------------------------------------------------------
--------------------------------------------------------------------------
    BASIN STORAGE, OUTFLOW AND DEPTH ROUTING VALUES:
     INTERVAL   {S-O*DT/2}   {S+O*DT/2}
      NUMBER   (ACRE-FEET) (ACRE-FEET)
          1      0.00000     0.00000
          2     12.64959    14.55041
          3     31.21598    34.38402
          4     54.44077    58.55923
```

WHERE S=STORAGE(AF);O=OUTFLOW(AF/MIN.);DT=UNIT(MIN.)

UNIT-HYDROGRAPH STORAGE-BASIN ROUTING

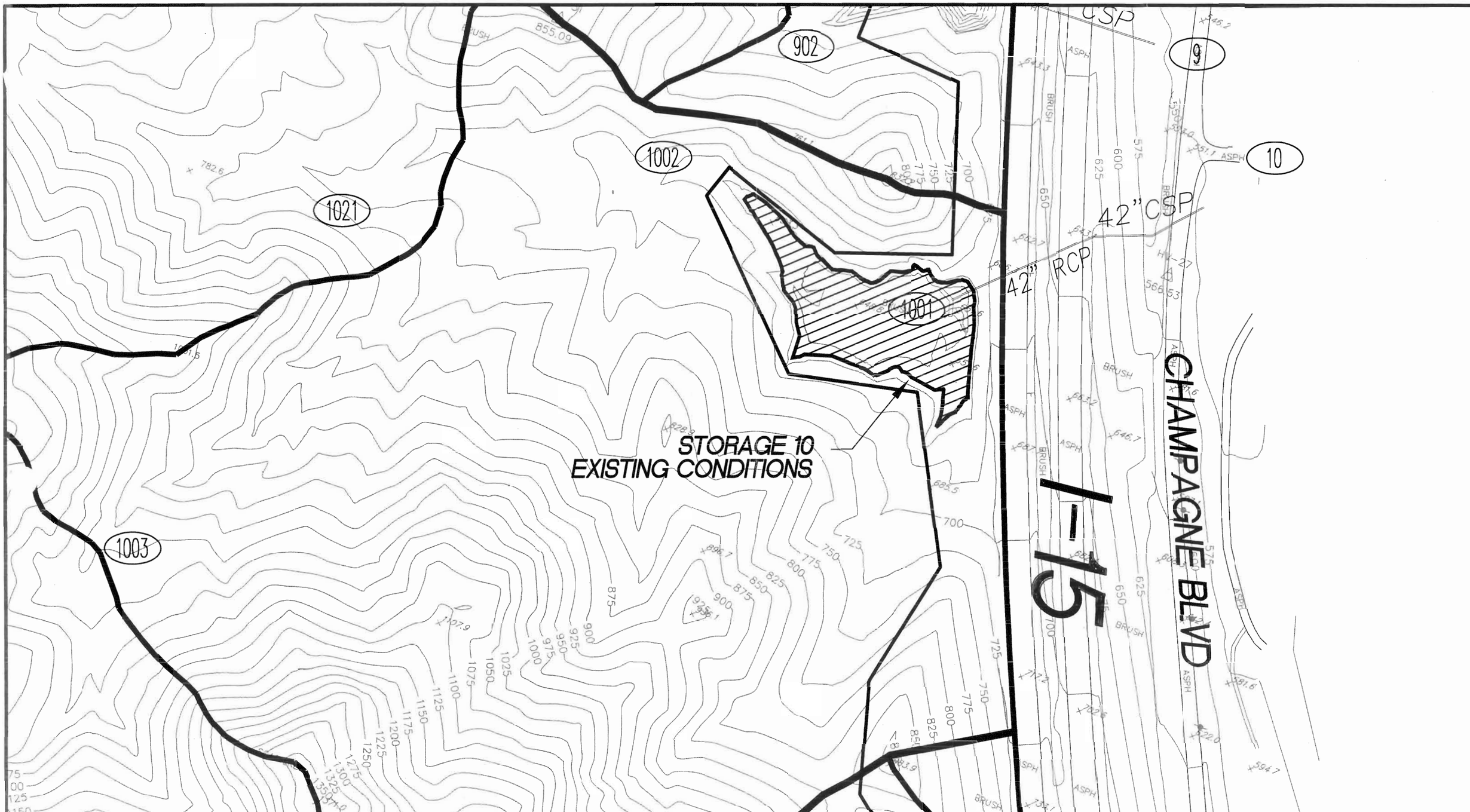
NOTE: COMPUTED BASIN DEPTH, OUTFLOW, AND STORAGE QUANTITIES OCCUR AT THE GIVEN TIME. BASIN INFLOW VALUES REPRESENT THE AVERAGE INFLOW DURING THE RECENT HYDROGRAPH UNIT INTERVAL.

GRAPH NOTATION: "I"=MEAN UNIT INFLOW; "O"=OUTFLOW AT GIVEN TIME

TIME (HOURS)	INFLOW (CFS)	OUTFLOW (CFS)	STORAGE (ACRE-FT)	0. 164. 329. 493. 658.
0.38	0.00	0.00	0.000	O
[BASIN DEPTH(FEET) =	0.00]			
0.77	0.00	0.00	0.000	O
[BASIN DEPTH(FEET) =	0.00]			
1.15	40.70	5.32	1.205	OI
[BASIN DEPTH(FEET) =	0.44]			
1.53	42.60	10.19	2.309	O I
[BASIN DEPTH(FEET) =	0.85]			
1.92	47.30	15.04	3.408	O I
[BASIN DEPTH(FEET) =	1.25]			
2.30	50.20	19.63	4.449	O I
[BASIN DEPTH(FEET) =	1.64]			
2.68	57.50	24.58	5.571	.OI
[BASIN DEPTH(FEET) =	2.05]			
3.07	62.30	29.50	6.688	.O I
[BASIN DEPTH(FEET) =	2.46]			
3.45	76.20	35.61	8.070	.O I
[BASIN DEPTH(FEET) =	2.97]			
3.83	86.80	42.29	9.586	. O I
[BASIN DEPTH(FEET) =	3.52]			
4.22	127.40	53.41	12.107	. O I
[BASIN DEPTH(FEET) =	4.45]			
4.60	165.30	63.93	15.485	. O I
[BASIN DEPTH(FEET) =	5.49]			
4.98	657.77	101.15	33.708	. O I
[BASIN DEPTH(FEET) =	10.19]			
5.37	102.20	101.19	33.741	. O
[BASIN DEPTH(FEET) =	10.20]			
5.75	68.40	99.84	32.723	. IO
[BASIN DEPTH(FEET) =	9.98]			
6.13	53.50	96.88	31.302	. I O
[BASIN DEPTH(FEET) =	9.61]			
6.52	44.80	93.55	29.705	. I O
[BASIN DEPTH(FEET) =	9.19]			
6.90	0.00	87.57	26.836	I O
[BASIN DEPTH(FEET) =	8.45]			
7.28	0.00	81.98	24.150	I O
[BASIN DEPTH(FEET) =	7.75]			
7.67	0.00	76.74	21.636	I O
[BASIN DEPTH(FEET) =	7.09]			
8.05	0.00	71.84	19.282	I O
[BASIN DEPTH(FEET) =	6.48]			
8.43	0.00	67.25	17.079	I O
[BASIN DEPTH(FEET) =	5.91]			
8.82	0.00	62.95	15.017	I O
[BASIN DEPTH(FEET) =	5.37]			
9.20	0.00	57.81	13.104	I O

```
   [BASIN DEPTH(FEET) =    4.82]
 9.58      0.00    50.26      11.392 I O     .       .       .       .
   [BASIN DEPTH(FEET) =    4.19]
 9.97      0.00    43.69       9.904 I O     .       .       .       .
   [BASIN DEPTH(FEET) =    3.64]
10.35      0.00    37.99       8.610 IO      .       .       .       .
   [BASIN DEPTH(FEET) =    3.17]
10.73      0.00    33.02       7.485 IO      .       .       .       .
   [BASIN DEPTH(FEET) =    2.75]
11.12      0.00    28.71       6.507 IO      .       .       .       .
   [BASIN DEPTH(FEET) =    2.39]
11.50      0.00    24.96       5.657 IO      .       .       .       .
   [BASIN DEPTH(FEET) =    2.08]
11.88      0.00    21.70       4.918 IO      .       .       .       .
   [BASIN DEPTH(FEET) =    1.81]
12.27      0.00    18.86       4.276 O       .       .       .       .
   [BASIN DEPTH(FEET) =    1.57]
12.65      0.00    16.40       3.717 O       .       .       .       .
   [BASIN DEPTH(FEET) =    1.37]
13.03      0.00    14.26       3.232 O       .       .       .       .
   [BASIN DEPTH(FEET) =    1.19]
13.42      0.00    12.39       2.809 O       .       .       .       .
   [BASIN DEPTH(FEET) =    1.03]
13.80      0.00    10.78       2.442 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.90]
14.18      0.00     9.37       2.123 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.78]
14.57      0.00     8.14       1.846 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.68]
14.95      0.00     7.08       1.605 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.59]
15.33      0.00     6.16       1.395 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.51]
15.72      0.00     5.35       1.213 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.45]
16.10      0.00     4.65       1.054 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.39]
16.48      0.00     4.04       0.917 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.34]
16.87      0.00     3.52       0.797 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.29]
17.25      0.00     3.06       0.693 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.25]
17.63      0.00     2.66       0.602 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.22]
18.02      0.00     2.31       0.524 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.19]
18.40      0.00     2.01       0.455 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.17]
18.78      0.00     1.75       0.396 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.15]
19.17      0.00     1.52       0.344 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.13]
19.55      0.00     1.32       0.299 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.11]
19.93      0.00     1.15       0.260 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.10]
20.32      0.00     1.00       0.226 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.08]
20.70      0.00     0.87       0.197 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.07]
21.08      0.00     0.75       0.171 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.06]
```

```
21.47     0.00     0.66      0.149 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.05]
21.85     0.00     0.57      0.129 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.05]
22.23     0.00     0.50      0.112 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.04]
22.62     0.00     0.43      0.098 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.04]
23.00     0.00     0.37      0.085 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.03]
```



SCALE: 1" = 250'

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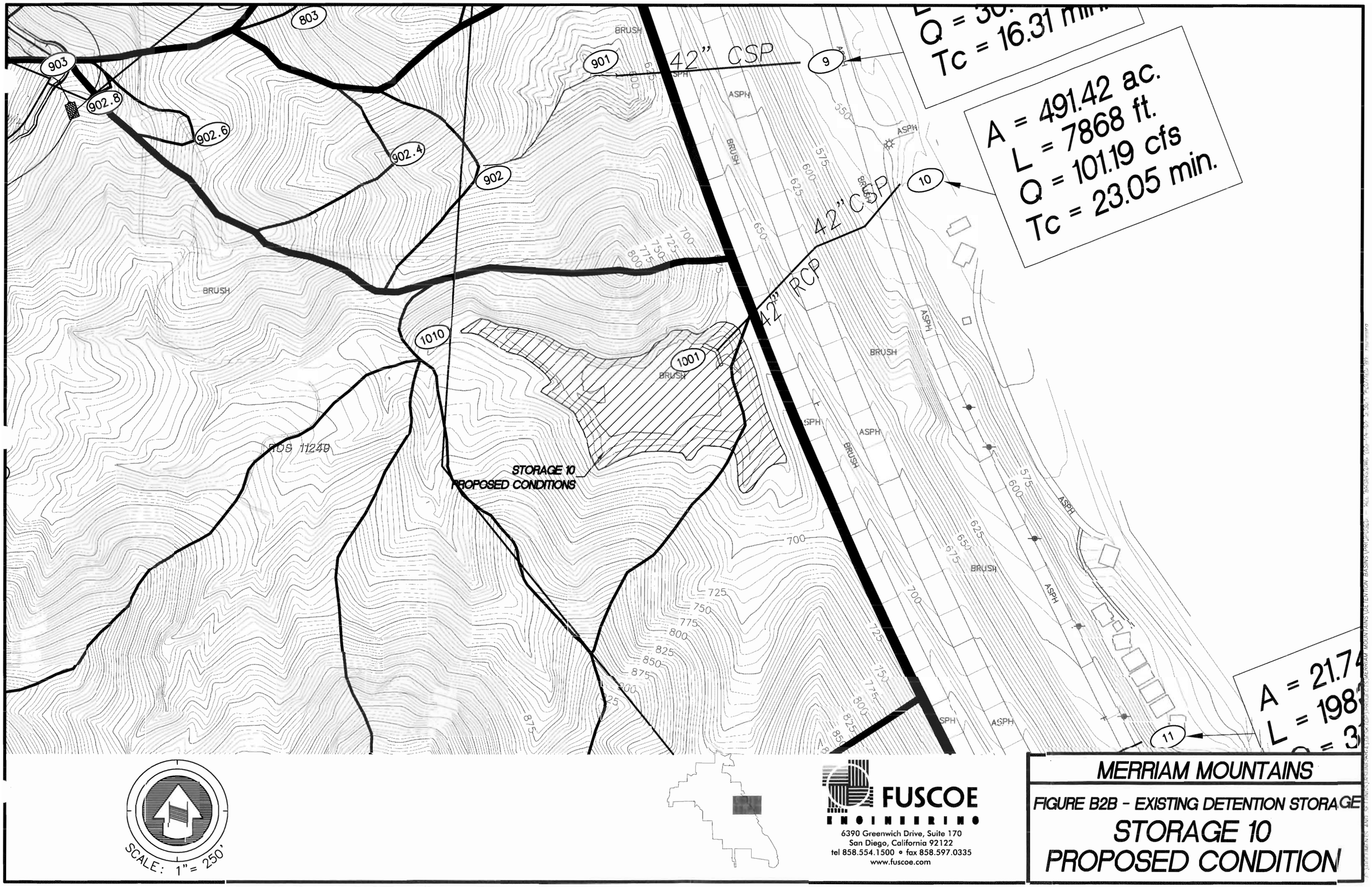
MERRIAM MOUNTAINS

FIGURE B2A - EXISTING DETENTION STORAGE

STORAGE 10
EXISTING CONDITION



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MERRIAM MOUNTAINS

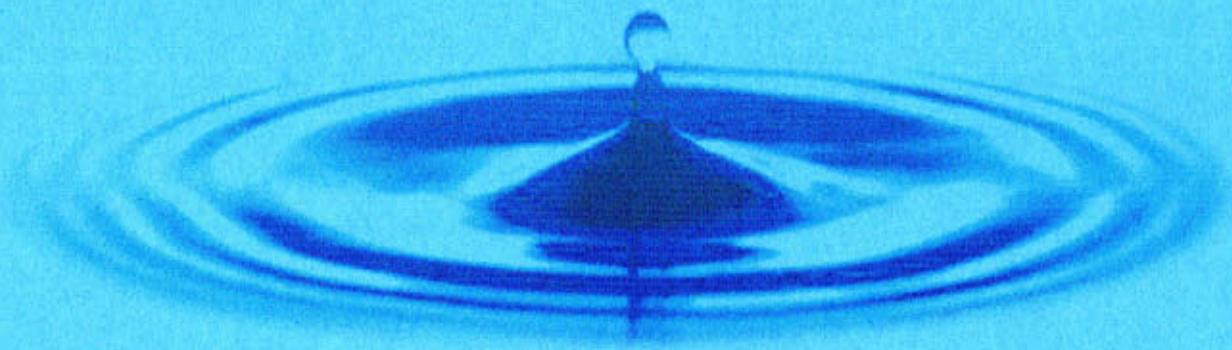
FIGURE B2B - EXISTING DETENTION STORAGE

STORAGE 10 PROPOSED CONDITION

APPENDIX B

Existing Detention Storage Analysis

SUB-BASIN 13



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Job Name:
Merriam Mountains - Existing Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR13

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
1305	1304.8	2	1,350.0	1,315.0	75.0	0.25	0.36	
1304.8	1304.6	5	1,315.0	1,270.0	300.0			
1304.8	1304.6	8				0.26	2.77	
1304.6	1304.4	5	1,270.0	195.0	600.0			
1304.6	1304.4	8				0.28	9.59	
1304.4	1304	5	1,195.0	1,150.0	315.0			
1304.4	1304	8				0.28	5.42	
1304	1303	5	1,150.0	835.0	1,044.0			
1304	1303	8				0.30	58.45	
1303	1301	5	835.0	795.0	875.0			
1302	1301	8				0.27	53.44	
1301	13	4	795.0	700.0	645.0			EX. 36" RCP Caltrans
								Storm Drain
							130.03	Total Area

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

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                          2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2004 Advanced Engineering Software (aes)
              Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:



 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTIANS - EXISTING HYDROLOGY                                  *
* SUBBASIN 13 - NO DETENTION ROUTING                                      *
* 2469.01A - MARCH 2007                                                   *
 **************************************************************************

  FILE NAME: MERR13.DAT
  TIME/DATE OF STUDY: 09:59 03/15/2007
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   1305.00 TO NODE   1304.80 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) =    75.00
  UPSTREAM ELEVATION(FEET) =   1350.00
  DOWNSTREAM ELEVATION(FEET) =   1315.00
  ELEVATION DIFFERENCE(FEET) =     35.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.427
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.747
SUBAREA RUNOFF(CFS) =      1.10
TOTAL AREA(ACRES) =      0.36   TOTAL RUNOFF(CFS) =      1.10

****************************************************************************
 FLOW PROCESS FROM NODE   1304.80 TO NODE   1306.60 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1315.00  DOWNSTREAM(FEET) =   1270.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.1500
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1350 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      1.10
 FLOW VELOCITY(FEET/SEC) =   2.13 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.35   Tc(MIN.) =   7.78
 LONGEST FLOWPATH FROM NODE   1305.00 TO NODE   1306.60 =   375.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1304.80 TO NODE   1304.60 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.934
 *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) =     2.77   SUBAREA RUNOFF(CFS) =     6.72
 TOTAL AREA(ACRES) =      3.13   TOTAL RUNOFF(CFS) =    7.60
 TC(MIN.) =   7.78

****************************************************************************
 FLOW PROCESS FROM NODE   1304.60 TO NODE   1304.40 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1270.00  DOWNSTREAM(FEET) =   1195.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   600.00   CHANNEL SLOPE =  0.1250
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1183 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      7.60
 FLOW VELOCITY(FEET/SEC) =   3.78 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.64   Tc(MIN.) =  10.42
 LONGEST FLOWPATH FROM NODE   1305.00 TO NODE   1304.40 =   975.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1304.60 TO NODE   1304.40 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.742
 *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) =     9.59   SUBAREA RUNOFF(CFS) =    19.27
 TOTAL AREA(ACRES) =     12.72   TOTAL RUNOFF(CFS) =   25.56
 TC(MIN.) =  10.42

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

```
 FLOW PROCESS FROM NODE   1304.40 TO NODE   1304.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1195.00  DOWNSTREAM(FEET) =   1150.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   315.00   CHANNEL SLOPE =  0.1429
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1302 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     25.56
 FLOW VELOCITY(FEET/SEC) =   5.95 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   0.88   Tc(MIN.) =  11.31
 LONGEST FLOWPATH FROM NODE   1305.00 TO NODE   1304.00 =  1290.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1304.40 TO NODE   1304.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.449
 *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) =    5.42   SUBAREA RUNOFF(CFS) =   10.34
 TOTAL AREA(ACRES) =     18.14   TOTAL RUNOFF(CFS) =   34.59
 TC(MIN.) =  11.31

****************************************************************************
 FLOW PROCESS FROM NODE   1304.00 TO NODE   1303.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1150.00  DOWNSTREAM(FEET) =    835.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1044.00   CHANNEL SLOPE =  0.3017
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1954 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =     34.59
 FLOW VELOCITY(FEET/SEC) =   8.06 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.16   Tc(MIN.) =  13.46
 LONGEST FLOWPATH FROM NODE   1305.00 TO NODE   1303.00 =  2334.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1304.00 TO NODE   1303.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.868
 *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) =   58.45   SUBAREA RUNOFF(CFS) =   99.58
 TOTAL AREA(ACRES) =     76.59   TOTAL RUNOFF(CFS) =  130.48
 TC(MIN.) =  13.46

****************************************************************************
 FLOW PROCESS FROM NODE   1303.00 TO NODE   1301.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =    835.00  DOWNSTREAM(FEET) =    795.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   875.00   CHANNEL SLOPE =  0.0457
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0457 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =    130.48
  FLOW VELOCITY(FEET/SEC) =   6.06 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.41   Tc(MIN.) =  15.87
  LONGEST FLOWPATH FROM NODE   1305.00 TO NODE   1301.00 =  3209.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1302.00 TO NODE   1301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.378
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =   53.44   SUBAREA RUNOFF(CFS) =   81.88
  TOTAL AREA(ACRES) =    130.03   TOTAL RUNOFF(CFS) =  199.24
  TC(MIN.) =  15.87

****************************************************************************
  FLOW PROCESS FROM NODE   1301.00 TO NODE     13.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   795.00  DOWNSTREAM(FEET) =   700.00
  FLOW LENGTH(FEET) =   645.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  24.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  38.26
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    199.24
  PIPE TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =  16.15
  LONGEST FLOWPATH FROM NODE   1305.00 TO NODE     13.00 =  3854.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    130.03  TC(MIN.) =     16.15
  PEAK FLOW RATE(CFS)   =    199.24
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

RATIONAL METHOD HYDROGRAPH PROGRAM
COPYRIGHT 1992, 2001 RICK ENGINEERING COMPANY

RUN DATE 3/15/2007
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 16 MIN.
6 ` `UR RAINFALL 3.5 INCHES
E N AREA 129.87 ACRES
RUNOFF COEFFICIENT 0.2844
PEAK DISCHARGE 199.24 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 16	DISCHARGE (CFS) = 7.7
TIME (MIN) = 32	DISCHARGE (CFS) = 8.1
TIME (MIN) = 48	DISCHARGE (CFS) = 8.4
TIME (MIN) = 64	DISCHARGE (CFS) = 9
TIME (MIN) = 80	DISCHARGE (CFS) = 9.4
TIME (MIN) = 96	DISCHARGE (CFS) = 10.2
TIME (MIN) = 112	DISCHARGE (CFS) = 10.7
TIME (MIN) = 128	DISCHARGE (CFS) = 11.8
TIME (MIN) = 144	DISCHARGE (CFS) = 12.5
TIME (MIN) = 160	DISCHARGE (CFS) = 14.4
TIME (MIN) = 176	DISCHARGE (CFS) = 15.6
TIME (MIN) = 192	DISCHARGE (CFS) = 19
TIME (MIN) = 208	DISCHARGE (CFS) = 21.7
TIME (MIN) = 224	DISCHARGE (CFS) = 31.8
TIME (MIN) = 240	DISCHARGE (CFS) = 6.5
TIME (MIN) = 256	DISCHARGE (CFS) = 199.24
TIME (MIN) = 272	DISCHARGE (CFS) = 25.5
TIME (MIN) = 288	DISCHARGE (CFS) = 17.1
TIME (MIN) = 304	DISCHARGE (CFS) = 13.4
TIME (MIN) = 320	DISCHARGE (CFS) = 11.2
TIME (MIN) = 336	DISCHARGE (CFS) = 9.7
TIME (MIN) = 352	DISCHARGE (CFS) = 8.7
TIME (MIN) = 368	DISCHARGE (CFS) = 7.9
TIME (MIN) = 384	DISCHARGE (CFS) = 0

```
**************************************************************************
                HYDRAULICS ELEMENTS - II  PROGRAM PACKAGE

                STORAGE BASIN HYDROGRAPH ROUTING MODEL
**************************************************************************
        (c) Copyright 1983-2004 Advanced Engineering Software (aes)
            Ver. 10.0  Release Date: 01/01/2004  License ID 1355

                        Analysis prepared by:



 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - EXISTING HYDROLOGY                                  *
* SUBBASIN #13 - EXISTING DETENTION STORAGE ROUTING                       *
* 2469.01A - MARCH 2007                                                  *
 **************************************************************************

    FILE NAME: MMDET13.DAT
    TIME/DATE OF STUDY: 10:35 03/15/2007
==========================================================================
    ENTERED INFORMATION:
--------------------------------------------------------------------------
    TOTAL NUMBER OF INFLOW HYDROGRAPH INTERVALS =   25
    CONSTANT HYDROGRAPH TIME UNIT(MINUTES) =   16.000
    ASSUMED INITIAL DEPTH(FEET) IN STORAGE BASIN =    0.00
--------------------------------------------------------------------------
    ENTERED INFLOW HYDROGRAPH ORDINATES(CFS):
    *INTERVAL    FLOW   *INTERVAL    FLOW   *INTERVAL    FLOW   *
    * NUMBER     (CFS)  * NUMBER     (CFS)  * NUMBER     (CFS)  *
    *    1:        0.00*    2:        7.70*    3:        8.10*
    *    4:        8.40*    5:        9.00*    6:        9.40*
    *    7:       10.20*    8:       10.70*    9:       11.80*
    *   10:       12.50*   11:       14.40*   12:       15.60*
    *   13:       19.00*   14:       21.70*   15:       31.80*
    *   16:        6.50*   17:      199.24*   18:       25.50*
    *   19:       17.10*   20:       13.40*   21:       11.20*
    *   22:        9.70*   23:        8.70*   24:        7.90*
    *   25:        0.00*
==========================================================================
    DEPTH-VS.-STORAGE AND DEPTH-VS.-DISCHARGE INFORMATION:
--------------------------------------------------------------------------
    TOTAL NUMBER OF BASIN DEPTH INFORMATION ENTRIES =   4
--------------------------------------------------------------------------
    *BASIN-DEPTH  STORAGE    OUTFLOW  **BASIN-DEPTH  STORAGE    OUTFLOW  *
    *   (FEET)  (ACRE-FEET)   (CFS)   **   (FEET)  (ACRE-FEET)   (CFS)   *
    *     0.000      0.000      0.000**     5.000      2.050     60.000*
    *    10.000      6.750    100.000**    15.000     13.480    130.000*
**************************************************************************
--------------------------------------------------------------------------
    INITIAL BASIN DEPTH(FEET) =    0.00
    INITIAL BASIN STORAGE(ACRE-FEET) =       0.00
    INITIAL BASIN OUTFLOW(CFS) =       0.00
--------------------------------------------------------------------------
--------------------------------------------------------------------------
    BASIN STORAGE, OUTFLOW AND DEPTH ROUTING VALUES:
     INTERVAL   {S-O*DT/2}   {S+O*DT/2}
      NUMBER   (ACRE-FEET) (ACRE-FEET)
          1      0.00000     0.00000
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        2      1.38884     2.71116
        3      5.64807     7.85193
        4     12.04749    14.91251
    WHERE S=STORAGE(AF);O=OUTFLOW(AF/MIN.);DT=UNIT(MIN.)
-------------------------------------------------------------------------------


        *UNIT-HYDROGRAPH STORAGE-BASIN ROUTING*
    NOTE: COMPUTED BASIN DEPTH, OUTFLOW, AND STORAGE QUANTITIES
          OCCUR AT THE GIVEN TIME. BASIN INFLOW VALUES REPRESENT THE
          AVERAGE INFLOW DURING THE RECENT HYDROGRAPH UNIT INTERVAL.

    GRAPH NOTATION: "I"=MEAN UNIT INFLOW; "O"=OUTFLOW AT GIVEN TIME
-------------------------------------------------------------------------------
     TIME   INFLOW  OUTFLOW    STORAGE
    (HOURS) (CFS)    (CFS)    (ACRE-FT)  0.     50.    100.    149.    199.
       0.27     0.00     0.00       0.000 O       .       .       .       .
         [BASIN DEPTH(FEET) =    0.00]
       0.53     7.70     3.76       0.128 OI      .       .       .       .
         [BASIN DEPTH(FEET) =    0.31]
       0.80     8.10     5.87       0.201 OI      .       .       .       .
         [BASIN DEPTH(FEET) =    0.49]
       1.07     8.40     7.11       0.243 .O      .       .       .       .
         [BASIN DEPTH(FEET) =    0.59]
       1.33     9.00     8.03       0.274 .O      .       .       .       .
         [BASIN DEPTH(FEET) =    0.67]
       1.60     9.40     8.70       0.297 .O      .       .       .       .
         [BASIN DEPTH(FEET) =    0.72]
       1.87    10.20     9.43       0.322 .O      .       .       .       .
         [BASIN DEPTH(FEET) =    0.79]
       2.13    10.70    10.05       0.343 .O      .       .       .       .
         [BASIN DEPTH(FEET) =    0.84]
       2.40    11.80    10.90       0.373 .O      .       .       .       .
         [BASIN DEPTH(FEET) =    0.91]
       2.67    12.50    11.68       0.399 .OI     .       .       .       .
         [BASIN DEPTH(FEET) =    0.97]
       2.93    14.40    13.01       0.444 . O     .       .       .       .
         [BASIN DEPTH(FEET) =    1.08]
       3.20    15.60    14.27       0.488 . O     .       .       .       .
         [BASIN DEPTH(FEET) =    1.19]
       3.47    19.00    16.58       0.566 . OI    .       .       .       .
         [BASIN DEPTH(FEET) =    1.38]
       3.73    21.70    19.08       0.652 .  O    .       .       .       .
         [BASIN DEPTH(FEET) =    1.59]
       4.00    31.80    25.28       0.864 .   OI  .       .       .       .
         [BASIN DEPTH(FEET) =    2.11]
       4.27     6.50    16.12       0.551 .IO     .       .       .       .
         [BASIN DEPTH(FEET) =    1.34]
       4.53   199.24    75.97       3.927 .       .   O   .       .       I
         [BASIN DEPTH(FEET) =    7.00]
       4.80    25.50    67.32       2.910 .   I   . O     .       .       .
         [BASIN DEPTH(FEET) =    5.91]
       5.07    17.10    56.32       1.924 . I     .O      .       .       .
         [BASIN DEPTH(FEET) =    4.69]
       5.33    13.40    35.39       1.209 . I  O  .       .       .       .
         [BASIN DEPTH(FEET) =    2.95]
       5.60    11.20    23.59       0.806 .I O    .       .       .       .
         [BASIN DEPTH(FEET) =    1.97]
       5.87     9.70    16.82       0.575 .IO     .       .       .       .
         [BASIN DEPTH(FEET) =    1.40]
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```
 6.13     8.70    12.86       0.439 .IO     .       .       .       .
   [BASIN DEPTH(FEET) =    1.07]
 6.40     7.90    10.44       0.357 .O      .       .       .       .
   [BASIN DEPTH(FEET) =    0.87]
 6.67     0.00     5.35       0.183 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.45]
 6.93     0.00     2.74       0.094 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.23]
 7.20     0.00     1.40       0.048 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.12]
 7.47     0.00     0.72       0.025 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.06]
 7.73     0.00     0.37       0.013 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.03]
 8.00     0.00     0.19       0.006 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.02]
 8.27     0.00     0.10       0.003 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.01]
 8.53     0.00     0.05       0.002 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
 8.80     0.00     0.03       0.001 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
 9.07     0.00     0.01       0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
 9.33     0.00     0.01       0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
 9.60     0.00     0.00       0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
 9.87     0.00     0.00       0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
10.13     0.00     0.00       0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
10.40     0.00     0.00       0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
10.67     0.00     0.00       0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
10.93     0.00     0.00       0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
11.20     0.00     0.00       0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
11.47     0.00     0.00       0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
11.73     0.00     0.00       0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
12.00     0.00     0.00       0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
12.27     0.00     0.00       0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
12.53     0.00     0.00       0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
12.80     0.00     0.00       0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
13.07     0.00     0.00       0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
13.33     0.00     0.00       0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
13.60     0.00     0.00       0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
13.87     0.00     0.00       0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
14.13     0.00     0.00       0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
14.40     0.00     0.00       0.000 O       .       .       .       .
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   [BASIN DEPTH(FEET) =    0.00]
14.67     0.00     0.00      0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
14.93     0.00     0.00      0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
15.20     0.00     0.00      0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
15.47     0.00     0.00      0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
15.73     0.00     0.00      0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
16.00     0.00     0.00      0.000 O       .       .       .       .
   [BASIN DEPTH(FEET) =    0.00]
```

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR13-P

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
1335	1334	2	1,307.2	1,307.0	100.0	0.79	0.17	
1334	1333	6	1,307.0	1,303.0	403.0	0.78	2.82	
1333	1331	3	1,297.0	1,287.0	500.0			
1332	1331	8				0.79	1.51	
1331	1330	3	1,287.0	1,125.0	420.0			
1331	1330	8				0.45	4.16	Fill Slope
1330	1310	5	1,125.0	840.0	1,170.0			
1330	1310	8				0.33	10.46	
1310	1310	10						Bank #1
1329	1328	2	1,300.2	1,300.0	100.0	0.79	0.25	
1328	1327	6	1,300.0	1,295.3	445.0	0.78	2.87	
1327	1326	3	1,290.0	1,285.0	264.0			
1326.1	1326	8				0.77	1.82	
1326	1325	3	1,285.0	1,283.0	74.0			
1325.1	1325	8				0.77	1.98	
1325	1324	3	1,283.0	1,280.0	387.0			
1324	1324	8				0.77	1.08	
1324	1322	3	1,280.0	1,275.0	235.0			
1323	1322	8				0.79	2.95	
1322	1321	3	1,275.0	1,165.0	355.0			
1321	1320	5	1,165.0	1,045.0	480.0			
1321	1320	8				0.32	7.09	
1320	1310	5	1,045.0	840.0	618.0			
1320	1310	8				0.26	6.38	
1310	1310	1						1 of 2
1313	1312	2	1,282.0	1,240.0	100.0	0.31	0.39	
1312	1311	5	1,240.0	1,075.0	835.0			
1312	1311	8				0.27	10.66	
1311	1310	5	1,075.0	840.0	725.0			
1311	1310	8				0.25	5.84	
1310	1310	1						2 of 2
1310	1310	11						ADD Bank #1
1310	1302	5	840.0	775.0	580.0			
1310	1302	8				0.27	6.24	
1302	1302	1						1 of 2
1307	1306	2	1,267.0	1,240.0	100.0	0.40	0.64	
1306	1304	5	1,240.0	1,045.0	935.0			
1306	1304	8				0.26	6.52	
1305	1304	8				0.27	6.11	
1304	1303	5	1,045.0	935.0	600.0			
1304	1303	8				0.25	13.86	
1303	1302	5	935.0	775.0	1,041.0			
1303	1302	8				0.27	12.12	
1302	1302	1						2 of 2

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Job Name:
Merriam Mountains - Proposed Hydrology

Date:
October 2006

Job #:
2469.01A

Run Name:
MERR13-P

Node to Node		Code	Elev 1 (feet)	Elev 2 (feet)	Length (feet)	Runoff Coeff.	Area (ac.)	Comments
1302	1301	5	775.0	760.0	130.0			
1302	1301	8				0.29	2.75	
1301	13	4	760.0	670.0	665.0			EX. 36" RCP Caltrans
								Storm Drain
							108.67	Total Area

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

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                        2003,1985,1981 HYDROLOGY MANUAL
        (c) Copyright 1982-2004 Advanced Engineering Software (aes)
            Ver. 2.0 Release Date: 01/01/2004  License ID 1355

                              Analysis prepared by:

                        FUSCOE ENGINEERING - SAN DIEGO, INC.
                          6390 GREENWICH DRIVE, SUITE 170
                            SAN DIEGO, CALIFORNIA 92122
                                 (858) 554-1500

 ************************** DESCRIPTION OF STUDY **************************
* MERRIAM MOUNTAINS - PROPOSED HYDROLOGY                                  *
* SUBBASIN # 13 - NO DETENTION ROUTING                                    *
* 2469.01A - OCTOBER 2006                                                 *
 **************************************************************************

  FILE NAME: MERR13-P.DAT
  TIME/DATE OF STUDY: 11:43 09/29/2006
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  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   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    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   1335.00 TO NODE   1334.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTAIL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .7900
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1307.20
  DOWNSTREAM ELEVATION(FEET) =   1307.00
  ELEVATION DIFFERENCE(FEET) =      0.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.971
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
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