

**PRELIMINARY HYDROLOGY
CALCULATIONS**

FOR

**TROPICA RANCH COMMERCE CENTER
TROPICA RANCH ROAD
COLTON, CALIFORNIA**

PPD
PREPARED FOR

TROPICA RANCH, LLC
C/O LDC INDUSTRIAL REALTY, LLC
115 AVENIDA SAN DIMAS
SAN CLEMENTE, CALIFORNIA 92672

TEL: (949) 226-4601

DATE: APRIL 5, 2017

JOB NO. 3535

PREPARED BY

THIENES ENGINEERING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
(714) 521-4811

**PRELIMINARY HYDROLOGY
CALCULATIONS**

FOR

**TRANSTECH
TROPICA RANCH ROAD**

**PREPARED BY BRIAN WEIL
UNDER THE SUPERVISION OF**

REINHARD STENZEL DATE:
R.C.E. 56155
EXP. 12/31/18

INTRODUCTION

A: PROJECT LOCATION

The project site is located north and south of Tropica Rancho Road west of La Cadena Drive in the City of Colton. Please see following page for vicinity map.

B: STUDY PURPOSE

The purpose of this study is to determine the 25-year and 100-year proposed condition hydrology for the project site.

C: PROJECT STAFF:

Thienes Engineering staff involved in this study include:

Reinhard Stenzel, PE
Brian Weil
Eduardo Toledanes



VICINITY MAP
FOR
TROPICA RANCHO ROAD

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DISCUSSION

Project Description

The proposed commercial site encompasses approximately 23.4 acres (2.2 acres + 21.2 acres). Proposed improvements to the site consist of paved vehicle parking areas and truck yards with three commercial type buildings and landscaping throughout the site. Underground chambers for water quality purposes, a concrete channel west of the proposed buildings and a public storm drain system at La Cadena Drive that will traverse west of Tropica Rancho Road and then connects to Santa Ana River.

Master Plan hydrology

The project site is modeled from the San Bernardino County Flood Control District Comprehensive Storm Drain Plan Project no. 3-18. Based from the Master Plan, the site was tabled to a proposed storm drain system in La Cadena Drive that ultimately drains to Santa Ana River. The Master Plan peak flow rates are for 25-year event. The total 25-year peak rate at the outlet (at Santa Ana River) is approximately 147 cfs.

See Appendix "A" for Reference materials

Existing Conditions

The project site is generally undeveloped dirt lot with little vegetations. Runoff from the southerly portion of site (south of Tropica Rancho road) including offsite runoff generally drains from south to the northwesterly corner of the property. Runoff then spills over to Tropica Rancho Road and ultimately discharged to Santa Ana River. Runoff from the remaining northerly portion of the site drains from east to west and conveyed to an existing concrete channel and ultimately discharged to Santa Ana River.

Proposed Conditions

Drainage pattern at proposed condition will maintain the same drainage pattern at existing condition. Runoff from the southerly portion of the site (Buildings 1 and 2) including offsite runoff drains into catch basins and conveyed north via proposed storm drain line and ultimately discharged to a proposed 60" R.C.P. public storm drain at Tropica Rancho Road. Runoff from the remaining northerly portion of the site (Building 3) will drain into catch basins and conveyed to a proposed 60" R.C.P. public storm drain that will ultimately discharged to Santa Ana River. The total 25-year peak flow rate and

100-year peak flow rate at the outlet of the proposed 60" R.C.P. public storm drain (node 75) is approximately 156 cfs. and 234.9 cfs.

Pipe sizing for the public storm drain will be based on a 100-year frequency.

See Appendix "B" for proposed condition hydrology calculations and Appendix "C" for Proposed condition hydrology.

Water Quality

The proposed underground chambers will be located south of Building 1 and west of Buildings 2 and 3. Runoff from these areas will be collected into proposed grate inlets and conveyed into proposed underground chambers for infiltration.

Any flow above water quality requirements or peak flows will be conveyed to the proposed onsite storm drain system and discharged to a public storm drain at Tropicana Rancho Road.

Methodology

San Bernardino County Rational Method program (AES Software) was used for the hydrology calculations. San Bernardino County Flood program, also AES Software, was used for the hydrograph and basin analysis. The site is composed of soil type "A", "B" and "C" per the San Bernardino County Hydrology Manual.

APPENDIX

DESCRIPTION

A

REFERENCE MATERIALS

B

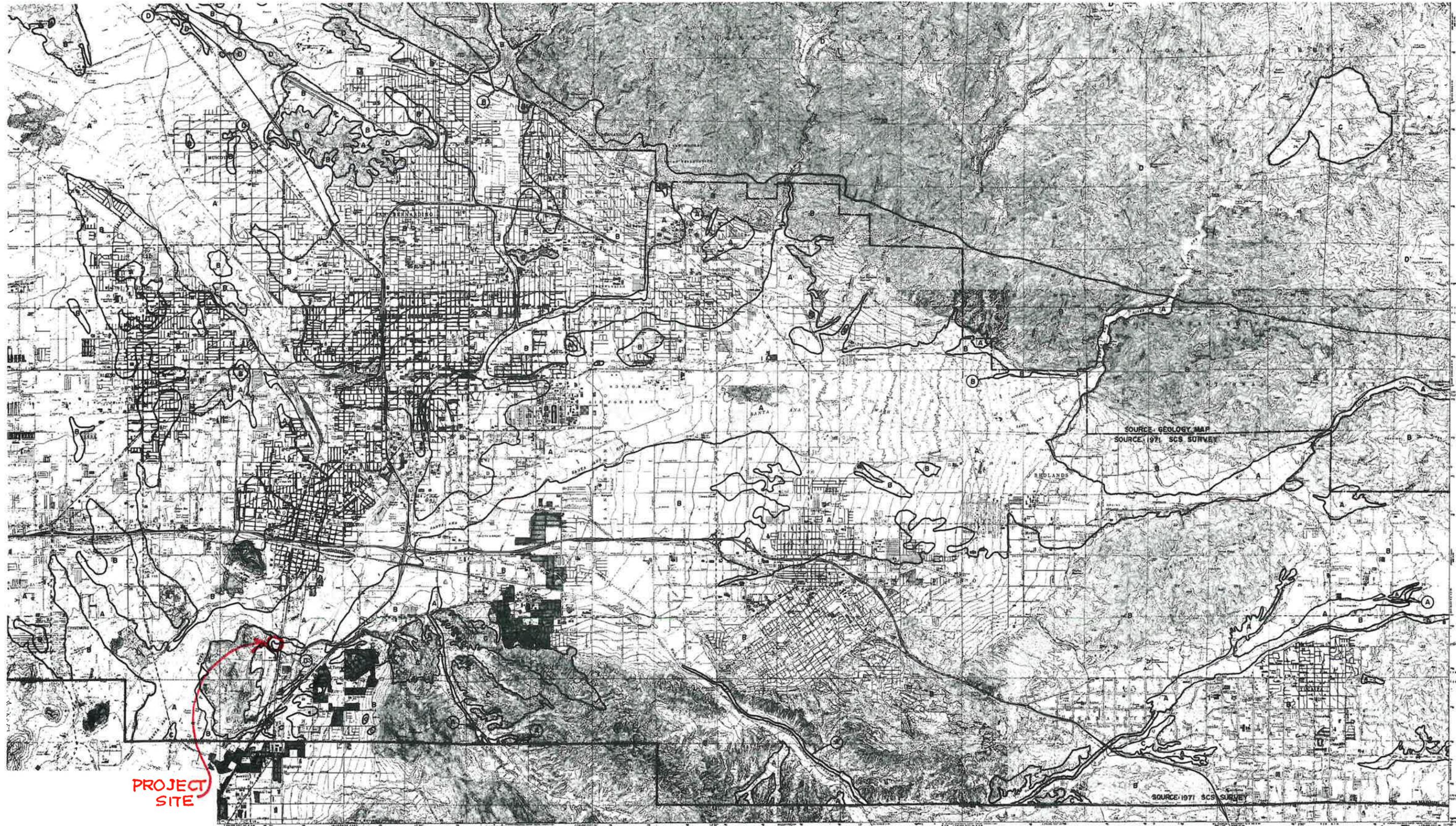
**HYDROLOGY CALCULATIONS
(PROPOSED CONDITION)
25-YEAR
100-YEAR**

C

HYDROLOGY MAP

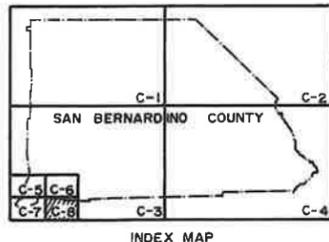
APPENDIX A

REFERENCE MATERIALS



PROJECT SITE

SOILS A, B & C



- LEGEND
- SOIL GROUP BOUNDARY
 - A SOIL GROUP DESIGNATION
 - - - BOUNDARY OF INDICATED SOURCE

SCALE REDUCED BY 1/2

SCALE 1:48,000

HYDROLOGIC SOILS GROUP MAP
FOR
SOUTHWEST-D AREA

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

25-YEAR FREQUENCY

Analysis prepared by:

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***** DESCRIPTION OF STUDY *****
 * LA CADENA DR COLTON, SAN BERNARDINO COUNTY *
 * 25-YEAR PROPOSED CONDITION *
 * ONSITE SD NODES 30-72 *

FILE NAME: C:\XDRIVE\3535\25P1.DAT
 TIME/DATE OF STUDY: 14:21 04/12/2017

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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

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

USER SPECIFIED STORM EVENT (YEAR) = 25.00
 SPECIFIED MINIMUM PIPE SIZE (INCH) = 12.00
 SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
 USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL

SLOPE OF INTENSITY DURATION CURVE (LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
 USER SPECIFIED 1-HOUR INTENSITY (INCH/HOUR) = 0.9500

ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

FLOW PROCESS FROM NODE 30.00 TO NODE 31.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH (FEET) = 776.00
 ELEVATION DATA: UPSTREAM (FEET) = 918.37 DOWNSTREAM (FEET) = 909.49

Tc = K * [(LENGTH** 3.00) / (ELEVATION CHANGE)] ** 0.20
 SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 10.644
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.681
 SUBAREA Tc AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL	A	0.60	0.98	0.10	32	10.64

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA RUNOFF (CFS) = 1.40
 TOTAL AREA (ACRES) = 0.60 PEAK FLOW RATE (CFS) = 1.40

FLOW PROCESS FROM NODE 30.00 TO NODE 31.00 IS CODE = 81

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

=====

MAINLINE Tc (MIN) = 10.64
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.681
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	2.05	0.75	0.10	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA (ACRES) = 2.05 SUBAREA RUNOFF (CFS) = 4.81
 EFFECTIVE AREA (ACRES) = 2.65 AREA-AVERAGED Fm (INCH/HR) = 0.08
 AREA-AVERAGED Fp (INCH/HR) = 0.80 AREA-AVERAGED Ap = 0.10
 TOTAL AREA (ACRES) = 2.65 PEAK FLOW RATE (CFS) = 6.20

FLOW PROCESS FROM NODE 30.00 TO NODE 31.00 IS CODE = 81

=====

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

=====

MAINLINE Tc (MIN) = 10.64
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.681
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "OPEN BRUSH"	C	0.60	0.43	1.00	77

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.43
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA (ACRES) = 0.60 SUBAREA RUNOFF (CFS) = 1.21
 EFFECTIVE AREA (ACRES) = 3.25 AREA-AVERAGED Fm (INCH/HR) = 0.15
 AREA-AVERAGED Fp (INCH/HR) = 0.55 AREA-AVERAGED Ap = 0.27
 TOTAL AREA (ACRES) = 3.25 PEAK FLOW RATE (CFS) = 7.42

FLOW PROCESS FROM NODE 30.00 TO NODE 31.00 IS CODE = 81

=====

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

MAINLINE Tc(MIN) = 10.64
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.681
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"2 DWELLINGS/ACRE" C 0.40 0.57 0.70 69
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.57
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
SUBAREA AREA(ACRES) = 0.40 SUBAREA RUNOFF(CFS) = 0.82
EFFECTIVE AREA(ACRES) = 3.65 AREA-AVERAGED Fm(INCH/HR) = 0.17
AREA-AVERAGED Fp(INCH/HR) = 0.55 AREA-AVERAGED Ap = 0.31
TOTAL AREA(ACRES) = 3.65 PEAK FLOW RATE(CFS) = 8.24

FLOW PROCESS FROM NODE 30.00 TO NODE 31.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 10.64
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.681
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"OPEN BRUSH" B 0.30 0.61 1.00 66
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 0.30 SUBAREA RUNOFF(CFS) = 0.56
EFFECTIVE AREA(ACRES) = 3.95 AREA-AVERAGED Fm(INCH/HR) = 0.21
AREA-AVERAGED Fp(INCH/HR) = 0.56 AREA-AVERAGED Ap = 0.37
TOTAL AREA(ACRES) = 3.95 PEAK FLOW RATE(CFS) = 8.80

FLOW PROCESS FROM NODE 31.00 TO NODE 32.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 904.80 DOWNSTREAM(FEET) = 900.83
FLOW LENGTH(FEET) = 265.00 MANNING'S N = 0.012
DEPTH OF FLOW IN 18.0 INCH PIPE IS 10.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 8.18
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 8.80
PIPE TRAVEL TIME(MIN.) = 0.54 Tc(MIN.) = 11.18
LONGEST FLOWPATH FROM NODE 30.00 TO NODE 32.00 = 1041.00 FEET.

FLOW PROCESS FROM NODE 32.00 TO NODE 32.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 11.18
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.603
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"OPEN BRUSH" B 0.20 0.61 1.00 66
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 0.20 SUBAREA RUNOFF(CFS) = 0.36
EFFECTIVE AREA(ACRES) = 4.15 AREA-AVERAGED Fm(INCH/HR) = 0.23
AREA-AVERAGED Fp(INCH/HR) = 0.57 AREA-AVERAGED Ap = 0.40
TOTAL AREA(ACRES) = 4.15 PEAK FLOW RATE(CFS) = 8.88

FLOW PROCESS FROM NODE 32.00 TO NODE 32.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 11.18
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.603
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"OPEN BRUSH" C 0.50 0.43 1.00 77
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.43
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 0.50 SUBAREA RUNOFF(CFS) = 0.98
EFFECTIVE AREA(ACRES) = 4.65 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.54 AREA-AVERAGED Ap = 0.46
TOTAL AREA(ACRES) = 4.65 PEAK FLOW RATE(CFS) = 9.85

FLOW PROCESS FROM NODE 32.00 TO NODE 32.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 11.18
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.603
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL

"2 DWELLINGS/ACRE" C 0.45 0.57 0.70 69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.57
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
 SUBAREA AREA (ACRES) = 0.45 SUBAREA RUNOFF (CFS) = 0.89
 EFFECTIVE AREA (ACRES) = 5.10 AREA-AVERAGED Fm (INCH/HR) = 0.26
 AREA-AVERAGED Fp (INCH/HR) = 0.54 AREA-AVERAGED Ap = 0.48
 TOTAL AREA (ACRES) = 5.10 PEAK FLOW RATE (CFS) = 10.75

 FLOW PROCESS FROM NODE 32.00 TO NODE 32.00 IS CODE = 81

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

=====

MAINLINE Tc (MIN) = 11.18
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.603
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 3.70 0.75 0.70 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
 SUBAREA AREA (ACRES) = 3.70 SUBAREA RUNOFF (CFS) = 6.92
 EFFECTIVE AREA (ACRES) = 8.80 AREA-AVERAGED Fm (INCH/HR) = 0.37
 AREA-AVERAGED Fp (INCH/HR) = 0.65 AREA-AVERAGED Ap = 0.57
 TOTAL AREA (ACRES) = 8.80 PEAK FLOW RATE (CFS) = 17.67

 FLOW PROCESS FROM NODE 32.00 TO NODE 32.00 IS CODE = 81

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

=====

MAINLINE Tc (MIN) = 11.18
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.603
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" C 0.75 0.57 0.70 69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.57
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
 SUBAREA AREA (ACRES) = 0.75 SUBAREA RUNOFF (CFS) = 1.49
 EFFECTIVE AREA (ACRES) = 9.55 AREA-AVERAGED Fm (INCH/HR) = 0.37
 AREA-AVERAGED Fp (INCH/HR) = 0.64 AREA-AVERAGED Ap = 0.58
 TOTAL AREA (ACRES) = 9.55 PEAK FLOW RATE (CFS) = 19.16

 FLOW PROCESS FROM NODE 32.00 TO NODE 32.00 IS CODE = 81

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

=====

MAINLINE Tc (MIN) = 11.18
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.603
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH" C 0.15 0.43 1.00 77
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.43
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA (ACRES) = 0.15 SUBAREA RUNOFF (CFS) = 0.29
 EFFECTIVE AREA (ACRES) = 9.70 AREA-AVERAGED Fm (INCH/HR) = 0.37
 AREA-AVERAGED Fp (INCH/HR) = 0.63 AREA-AVERAGED Ap = 0.59
 TOTAL AREA (ACRES) = 9.70 PEAK FLOW RATE (CFS) = 19.45

 FLOW PROCESS FROM NODE 32.00 TO NODE 32.00 IS CODE = 81

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

=====

MAINLINE Tc (MIN) = 11.18
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.603
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH" B 0.15 0.61 1.00 66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA (ACRES) = 0.15 SUBAREA RUNOFF (CFS) = 0.27
 EFFECTIVE AREA (ACRES) = 9.85 AREA-AVERAGED Fm (INCH/HR) = 0.38
 AREA-AVERAGED Fp (INCH/HR) = 0.63 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 9.85 PEAK FLOW RATE (CFS) = 19.72

 FLOW PROCESS FROM NODE 32.00 TO NODE 43.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM (FEET) = 900.83 DOWNSTREAM (FEET) = 900.70
 FLOW LENGTH (FEET) = 45.00 MANNING'S N = 0.012
 DEPTH OF FLOW IN 30.0 INCH PIPE IS 21.2 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 5.32
 ESTIMATED PIPE DIAMETER (INCH) = 30.00 NUMBER OF PIPES = 1
 PIPE-FLOW (CFS) = 19.72
 PIPE TRAVEL TIME (MIN.) = 0.14 Tc (MIN.) = 11.33
 LONGEST FLOWPATH FROM NODE 30.00 TO NODE 43.00 = 1086.00 FEET.

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*****
FLOW PROCESS FROM NODE 43.00 TO NODE 43.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
-----
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 11.33
RAINFALL INTENSITY(INCH/HR) = 2.58
AREA-AVERAGED Fm(INCH/HR) = 0.38
AREA-AVERAGED Fp(INCH/HR) = 0.63
AREA-AVERAGED Ap = 0.60
EFFECTIVE STREAM AREA(ACRES) = 9.85
TOTAL STREAM AREA(ACRES) = 9.85
PEAK FLOW RATE(CFS) AT CONFLUENCE = 19.72

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FLOW PROCESS FROM NODE 40.00 TO NODE 41.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
-----
INITIAL SUBAREA FLOW-LENGTH(FEET) = 540.00
ELEVATION DATA: UPSTREAM( FEET) = 913.16 DOWNSTREAM( FEET) = 909.14

Tc = K * [(LENGTH** 3.00) / (ELEVATION CHANGE)] ** 0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.034
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.778
SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
COMMERCIAL B 0.45 0.75 0.10 56 10.03
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
SUBAREA RUNOFF(CFS) = 1.09
TOTAL AREA(ACRES) = 0.45 PEAK FLOW RATE(CFS) = 1.09

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*****
FLOW PROCESS FROM NODE 40.00 TO NODE 41.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 10.03
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.778
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL A 0.80 0.98 0.10 32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
SUBAREA AREA(ACRES) = 0.80 SUBAREA RUNOFF(CFS) = 1.93
EFFECTIVE AREA(ACRES) = 1.25 AREA-AVERAGED Fm(INCH/HR) = 0.09
AREA-AVERAGED Fp(INCH/HR) = 0.89 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 1.25 PEAK FLOW RATE(CFS) = 3.02

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*****
FLOW PROCESS FROM NODE 40.00 TO NODE 41.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 10.03
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.778
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"OPEN BRUSH" A 0.20 0.86 1.00 46
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 0.20 SUBAREA RUNOFF(CFS) = 0.35
EFFECTIVE AREA(ACRES) = 1.45 AREA-AVERAGED Fm(INCH/HR) = 0.20
AREA-AVERAGED Fp(INCH/HR) = 0.87 AREA-AVERAGED Ap = 0.22
TOTAL AREA(ACRES) = 1.45 PEAK FLOW RATE(CFS) = 3.37

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FLOW PROCESS FROM NODE 41.00 TO NODE 42.00 IS CODE = 9
-----
>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<
-----
UPSTREAM NODE ELEVATION( FEET) = 909.14
DOWNSTREAM NODE ELEVATION( FEET) = 906.39
CHANNEL LENGTH THRU SUBAREA( FEET) = 551.00
"V" GUTTER WIDTH( FEET) = 3.00 GUTTER HIKE( FEET) = 0.150
PAVEMENT LIP( FEET) = 0.030 MANNING'S N = .0150
PAVEMENT CROSSFALL( DECIMAL NOTATION) = 0.02000
MAXIMUM DEPTH( FEET) = 1.00
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.252
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL A 6.10 0.98 0.10 32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.10
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 2.18
AVERAGE FLOW DEPTH( FEET) = 0.43 FLOOD WIDTH( FEET) = 27.90
"V" GUTTER FLOW TRAVEL TIME(MIN.) = 4.20 Tc(MIN.) = 14.24
SUBAREA AREA(ACRES) = 6.10 SUBAREA RUNOFF(CFS) = 11.83
EFFECTIVE AREA(ACRES) = 7.55 AREA-AVERAGED Fm(INCH/HR) = 0.12

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AREA-AVERAGED Fp (INCH/HR) = 0.94 AREA-AVERAGED Ap = 0.12
 TOTAL AREA (ACRES) = 7.55 PEAK FLOW RATE (CFS) = 14.51

END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.49 FLOOD WIDTH (FEET) = 33.99
 FLOW VELOCITY (FEET/SEC.) = 2.40 DEPTH*VELOCITY (FT*FT/SEC) = 1.18
 LONGEST FLOWPATH FROM NODE 40.00 TO NODE 42.00 = 1091.00 FEET.

 FLOW PROCESS FROM NODE 41.00 TO NODE 42.00 IS CODE = 81

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

MAINLINE Tc (MIN) = 14.24
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.252
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL B 5.55 0.75 0.10 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA (ACRES) = 5.55 SUBAREA RUNOFF (CFS) = 10.88
 EFFECTIVE AREA (ACRES) = 13.10 AREA-AVERAGED Fm (INCH/HR) = 0.10
 AREA-AVERAGED Fp (INCH/HR) = 0.87 AREA-AVERAGED Ap = 0.11
 TOTAL AREA (ACRES) = 13.10 PEAK FLOW RATE (CFS) = 25.39

 FLOW PROCESS FROM NODE 41.00 TO NODE 42.00 IS CODE = 81

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

MAINLINE Tc (MIN) = 14.24
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.252
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH" A 0.40 0.86 1.00 46
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA (ACRES) = 0.40 SUBAREA RUNOFF (CFS) = 0.50
 EFFECTIVE AREA (ACRES) = 13.50 AREA-AVERAGED Fm (INCH/HR) = 0.12
 AREA-AVERAGED Fp (INCH/HR) = 0.87 AREA-AVERAGED Ap = 0.14
 TOTAL AREA (ACRES) = 13.50 PEAK FLOW RATE (CFS) = 25.89

 FLOW PROCESS FROM NODE 42.00 TO NODE 43.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM (FEET) = 901.40 DOWNSTREAM (FEET) = 900.60
 FLOW LENGTH (FEET) = 110.00 MANNING'S N = 0.012
 DEPTH OF FLOW IN 27.0 INCH PIPE IS 20.6 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 7.97
 ESTIMATED PIPE DIAMETER (INCH) = 27.00 NUMBER OF PIPES = 1
 PIPE-FLOW (CFS) = 25.89
 PIPE TRAVEL TIME (MIN.) = 0.23 Tc (MIN.) = 14.47
 LONGEST FLOWPATH FROM NODE 40.00 TO NODE 43.00 = 1201.00 FEET.

 FLOW PROCESS FROM NODE 43.00 TO NODE 43.00 IS CODE = 1

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

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 14.47
 RAINFALL INTENSITY (INCH/HR) = 2.23
 AREA-AVERAGED Fm (INCH/HR) = 0.12
 AREA-AVERAGED Fp (INCH/HR) = 0.87
 AREA-AVERAGED Ap = 0.14
 EFFECTIVE STREAM AREA (ACRES) = 13.50
 TOTAL STREAM AREA (ACRES) = 13.50
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 25.89

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19.72	11.33	2.583	0.63 (0.38)	0.60	9.8	30.00
2	25.89	14.47	2.230	0.87 (0.12)	0.14	13.5	40.00

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	43.38	11.33	2.583	0.68 (0.25)	0.36	20.4	30.00
2	42.45	14.47	2.230	0.69 (0.23)	0.33	23.3	40.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 43.38 Tc (MIN.) = 11.33
 EFFECTIVE AREA (ACRES) = 20.42 AREA-AVERAGED Fm (INCH/HR) = 0.25
 AREA-AVERAGED Fp (INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.36
 TOTAL AREA (ACRES) = 23.35
 LONGEST FLOWPATH FROM NODE 40.00 TO NODE 43.00 = 1201.00 FEET.

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*****
FLOW PROCESS FROM NODE      43.00 TO NODE      44.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 900.60 DOWNSTREAM(FEET) = 900.15
FLOW LENGTH(FEET) = 91.00 MANNING'S N = 0.012
DEPTH OF FLOW IN 36.0 INCH PIPE IS 26.1 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 7.90
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 43.38
PIPE TRAVEL TIME(MIN.) = 0.19 Tc(MIN.) = 11.52
LONGEST FLOWPATH FROM NODE 40.00 TO NODE 44.00 = 1292.00 FEET.
*****
FLOW PROCESS FROM NODE      44.00 TO NODE      44.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 11.52
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.557
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE           GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"OPEN BRUSH"       B       0.45   0.61   1.00   66
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 0.45 SUBAREA RUNOFF(CFS) = 0.79
EFFECTIVE AREA(ACRES) = 20.87 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.37
TOTAL AREA(ACRES) = 23.80 PEAK FLOW RATE(CFS) = 43.38
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
*****
FLOW PROCESS FROM NODE      44.00 TO NODE      44.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 11.52
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.557
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE           GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"2 DWELLINGS/ACRE" C       0.10   0.57   0.70   69
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.57
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
SUBAREA AREA(ACRES) = 0.10 SUBAREA RUNOFF(CFS) = 0.19
EFFECTIVE AREA(ACRES) = 20.97 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.38
TOTAL AREA(ACRES) = 23.90 PEAK FLOW RATE(CFS) = 43.47
*****
FLOW PROCESS FROM NODE      44.00 TO NODE      44.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 11.52
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.557
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE           GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"2 DWELLINGS/ACRE" C       0.50   0.57   0.70   69
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.57
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
SUBAREA AREA(ACRES) = 0.50 SUBAREA RUNOFF(CFS) = 0.97
EFFECTIVE AREA(ACRES) = 21.47 AREA-AVERAGED Fm(INCH/HR) = 0.26
AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.38
TOTAL AREA(ACRES) = 24.40 PEAK FLOW RATE(CFS) = 44.44
*****
FLOW PROCESS FROM NODE      44.00 TO NODE      44.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 11.52
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.557
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE           GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"2 DWELLINGS/ACRE" B       0.35   0.75   0.70   56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
SUBAREA AREA(ACRES) = 0.35 SUBAREA RUNOFF(CFS) = 0.64
EFFECTIVE AREA(ACRES) = 21.82 AREA-AVERAGED Fm(INCH/HR) = 0.26
AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.39
TOTAL AREA(ACRES) = 24.75 PEAK FLOW RATE(CFS) = 45.09
*****
FLOW PROCESS FROM NODE      44.00 TO NODE      45.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 900.15 DOWNSTREAM(FEET) = 899.55

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FLOW LENGTH(FEET) = 100.00 MANNING'S N = 0.012
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 25.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 8.62
 ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 45.09
 PIPE TRAVEL TIME(MIN.) = 0.19 Tc(MIN.) = 11.71
 LONGEST FLOWPATH FROM NODE 40.00 TO NODE 45.00 = 1392.00 FEET.

 FLOW PROCESS FROM NODE 45.00 TO NODE 45.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 11.71
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.532
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH" B 0.50 0.61 1.00 66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 0.50 SUBAREA RUNOFF(CFS) = 0.86
 EFFECTIVE AREA(ACRES) = 22.32 AREA-AVERAGED Fm(INCH/HR) = 0.27
 AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.40
 TOTAL AREA(ACRES) = 25.25 PEAK FLOW RATE(CFS) = 45.45

 FLOW PROCESS FROM NODE 45.00 TO NODE 45.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 11.71
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.532
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" C 2.55 0.57 0.70 69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.57
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
 SUBAREA AREA(ACRES) = 2.55 SUBAREA RUNOFF(CFS) = 4.90
 EFFECTIVE AREA(ACRES) = 24.87 AREA-AVERAGED Fm(INCH/HR) = 0.28
 AREA-AVERAGED Fp(INCH/HR) = 0.65 AREA-AVERAGED Ap = 0.43
 TOTAL AREA(ACRES) = 27.80 PEAK FLOW RATE(CFS) = 50.35

 FLOW PROCESS FROM NODE 45.00 TO NODE 45.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 11.71
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.532
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 1.45 0.75 0.70 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
 SUBAREA AREA(ACRES) = 1.45 SUBAREA RUNOFF(CFS) = 2.62
 EFFECTIVE AREA(ACRES) = 26.32 AREA-AVERAGED Fm(INCH/HR) = 0.30
 AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.45
 TOTAL AREA(ACRES) = 29.25 PEAK FLOW RATE(CFS) = 52.97

 FLOW PROCESS FROM NODE 45.00 TO NODE 46.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 899.55 DOWNSTREAM(FEET) = 898.40
 FLOW LENGTH(FEET) = 208.00 MANNING'S N = 0.012
 DEPTH OF FLOW IN 39.0 INCH PIPE IS 26.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 8.71
 ESTIMATED PIPE DIAMETER(INCH) = 39.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 52.97
 PIPE TRAVEL TIME(MIN.) = 0.40 Tc(MIN.) = 12.11
 LONGEST FLOWPATH FROM NODE 40.00 TO NODE 46.00 = 1600.00 FEET.

 FLOW PROCESS FROM NODE 46.00 TO NODE 46.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 12.11
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.482
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH" B 0.55 0.61 1.00 66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 0.55 SUBAREA RUNOFF(CFS) = 0.92
 EFFECTIVE AREA(ACRES) = 26.87 AREA-AVERAGED Fm(INCH/HR) = 0.30
 AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.46
 TOTAL AREA(ACRES) = 29.80 PEAK FLOW RATE(CFS) = 52.97
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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*****
FLOW PROCESS FROM NODE      46.00 TO NODE      47.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 898.40 DOWNSTREAM(FEET) = 896.95
FLOW LENGTH( FEET) = 290.00 MANNING'S N = 0.012
DEPTH OF FLOW IN 39.0 INCH PIPE IS 27.9 INCHES
PIPE-FLOW VELOCITY( FEET/SEC.) = 8.36
ESTIMATED PIPE DIAMETER( INCH) = 39.00 NUMBER OF PIPES = 1
PIPE-FLOW( CFS) = 52.97
PIPE TRAVEL TIME( MIN.) = 0.58 Tc( MIN.) = 12.69
LONGEST FLOWPATH FROM NODE 40.00 TO NODE 47.00 = 1890.00 FEET.

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*****
FLOW PROCESS FROM NODE      47.00 TO NODE      47.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc( MIN.) = 12.69
* 25 YEAR RAINFALL INTENSITY( INCH/HR) = 2.413
SUBAREA LOSS RATE DATA( AMC II):
DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS
LAND USE              GROUP   (ACRES)  (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"OPEN BRUSH"          B      0.65      0.61      1.00      66
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp( INCH/HR) = 0.61
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA( ACRES) = 0.65 SUBAREA RUNOFF( CFS) = 1.05
EFFECTIVE AREA( ACRES) = 27.52 AREA-AVERAGED Fm( INCH/HR) = 0.31
AREA-AVERAGED Fp( INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.47
TOTAL AREA( ACRES) = 30.45 PEAK FLOW RATE( CFS) = 52.97
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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*****
FLOW PROCESS FROM NODE      47.00 TO NODE      72.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
-----
ELEVATION DATA: UPSTREAM( FEET) = 896.95 DOWNSTREAM( FEET) = 896.00
FLOW LENGTH( FEET) = 134.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 36.0 INCH PIPE IS 28.5 INCHES
PIPE-FLOW VELOCITY( FEET/SEC.) = 8.82
ESTIMATED PIPE DIAMETER( INCH) = 36.00 NUMBER OF PIPES = 1
PIPE-FLOW( CFS) = 52.97
PIPE TRAVEL TIME( MIN.) = 0.25 Tc( MIN.) = 12.94
LONGEST FLOWPATH FROM NODE 40.00 TO NODE 72.00 = 2024.00 FEET.

```

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-----
END OF STUDY SUMMARY:
TOTAL AREA( ACRES) = 30.45 TC( MIN.) = 12.94
EFFECTIVE AREA( ACRES) = 27.52 AREA-AVERAGED Fm( INCH/HR) = 0.31
AREA-AVERAGED Fp( INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.47
PEAK FLOW RATE( CFS) = 52.97

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** PEAK FLOW RATE TABLE **

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STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap Ae (ACRES)	HEADWATER NODE
1	52.97	12.94	2.385	0.66 (0.31)	0.47 27.5	30.00
2	50.47	16.10	2.092	0.66 (0.29)	0.44 30.4	40.00

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END OF RATIONAL METHOD ANALYSIS

```

Analysis prepared by:

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***** DESCRIPTION OF STUDY *****
* LA CADENA DR COLTON, SAN BERNARDINO COUNTY *
* 25-YEAR PROPOSED CONDITION *
* PUBLIC SD NODES 50-75 *

FILE NAME: C:\XDRIVE\3535\25PUB.DAT
TIME/DATE OF STUDY: 14:25 04/12/2017

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

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

USER SPECIFIED STORM EVENT (YEAR) = 25.00
SPECIFIED MINIMUM PIPE SIZE (INCH) = 12.00
SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL

SLOPE OF INTENSITY DURATION CURVE (LOG(I; IN/HR) vs. LOG(Tc; MIN)) = 0.6000
USER SPECIFIED 1-HOUR INTENSITY (INCH/HOUR) = 0.9500

ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

FLOW PROCESS FROM NODE 50.00 TO NODE 51.00 IS CODE = 21

=====

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

=====

INITIAL SUBAREA FLOW-LENGTH (FEET) = 750.00
ELEVATION DATA: UPSTREAM (FEET) = 1400.00 DOWNSTREAM (FEET) = 1240.00

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$
SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 10.101
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.767
SUBAREA T_c AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL POOR COVER "WOODLAND"	C	3.90	0.43	1.00	77	10.10

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.43
SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 1.00
SUBAREA RUNOFF (CFS) = 8.19
TOTAL AREA (ACRES) = 3.90 PEAK FLOW RATE (CFS) = 8.19

FLOW PROCESS FROM NODE 51.00 TO NODE 52.00 IS CODE = 51

=====

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

=====

ELEVATION DATA: UPSTREAM (FEET) = 1240.00 DOWNSTREAM (FEET) = 1050.00
CHANNEL LENGTH THRU SUBAREA (FEET) = 650.00 CHANNEL SLOPE = 0.2923
CHANNEL BASE (FEET) = 50.00 "Z" FACTOR = 6.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 2.00
CHANNEL FLOW THRU SUBAREA (CFS) = 8.19
FLOW VELOCITY (FEET/SEC) = 3.35 FLOW DEPTH (FEET) = 0.05
TRAVEL TIME (MIN.) = 3.24 T_c (MIN.) = 13.34
LONGEST FLOWPATH FROM NODE 50.00 TO NODE 52.00 = 1400.00 FEET.

FLOW PROCESS FROM NODE 51.00 TO NODE 52.00 IS CODE = 81

=====

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

=====

MAINLINE T_c (MIN) = 13.34
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.342
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL POOR COVER "OPEN BRUSH"	C	10.50	0.31	1.00	84

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.31
SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 1.00
SUBAREA AREA (ACRES) = 10.50 SUBAREA RUNOFF (CFS) = 19.22
EFFECTIVE AREA (ACRES) = 14.40 AREA-AVERAGED F_m (INCH/HR) = 0.34
AREA-AVERAGED F_p (INCH/HR) = 0.34 AREA-AVERAGED A_p = 1.00
TOTAL AREA (ACRES) = 14.40 PEAK FLOW RATE (CFS) = 25.92

FLOW PROCESS FROM NODE 51.00 TO NODE 52.00 IS CODE = 81

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

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MAINLINE Tc(MIN) = 13.34
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.342
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL POOR COVER
 "OPEN BRUSH" B 0.95 0.45 1.00 76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 0.95 SUBAREA RUNOFF(CFS) = 1.62
 EFFECTIVE AREA(ACRES) = 15.35 AREA-AVERAGED Fm(INCH/HR) = 0.35
 AREA-AVERAGED Fp(INCH/HR) = 0.35 AREA-AVERAGED Ap = 1.00
 TOTAL AREA(ACRES) = 15.35 PEAK FLOW RATE(CFS) = 27.53

 FLOW PROCESS FROM NODE 52.00 TO NODE 53.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 =====
 ELEVATION DATA: UPSTREAM(FEET) = 1050.00 DOWNSTREAM(FEET) = 1007.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 847.00 CHANNEL SLOPE = 0.0508
 CHANNEL BASE(FEET) = 50.00 "Z" FACTOR = 6.000
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 27.53
 FLOW VELOCITY(FEET/SEC) = 3.31 FLOW DEPTH(FEET) = 0.16
 TRAVEL TIME(MIN.) = 4.26 Tc(MIN.) = 17.60
 LONGEST FLOWPATH FROM NODE 50.00 TO NODE 53.00 = 2247.00 FEET.

 FLOW PROCESS FROM NODE 52.00 TO NODE 53.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
 =====
 MAINLINE Tc(MIN) = 17.60
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.983
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL POOR COVER
 "OPEN BRUSH" B 5.75 0.45 1.00 76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 5.75 SUBAREA RUNOFF(CFS) = 7.92
 EFFECTIVE AREA(ACRES) = 21.10 AREA-AVERAGED Fm(INCH/HR) = 0.38
 AREA-AVERAGED Fp(INCH/HR) = 0.38 AREA-AVERAGED Ap = 1.00
 TOTAL AREA(ACRES) = 21.10 PEAK FLOW RATE(CFS) = 30.50

 FLOW PROCESS FROM NODE 52.00 TO NODE 53.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
 =====
 MAINLINE Tc(MIN) = 17.60
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.983
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL POOR COVER
 "OPEN BRUSH" C 6.70 0.31 1.00 84
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.31
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 6.70 SUBAREA RUNOFF(CFS) = 10.10
 EFFECTIVE AREA(ACRES) = 27.80 AREA-AVERAGED Fm(INCH/HR) = 0.36
 AREA-AVERAGED Fp(INCH/HR) = 0.36 AREA-AVERAGED Ap = 1.00
 TOTAL AREA(ACRES) = 27.80 PEAK FLOW RATE(CFS) = 40.60

 FLOW PROCESS FROM NODE 53.00 TO NODE 54.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 =====
 ELEVATION DATA: UPSTREAM(FEET) = 1007.00 DOWNSTREAM(FEET) = 1005.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 376.00 CHANNEL SLOPE = 0.0053
 CHANNEL BASE(FEET) = 50.00 "Z" FACTOR = 6.000
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 40.60
 FLOW VELOCITY(FEET/SEC) = 1.93 FLOW DEPTH(FEET) = 0.40
 TRAVEL TIME(MIN.) = 3.25 Tc(MIN.) = 20.85
 LONGEST FLOWPATH FROM NODE 50.00 TO NODE 54.00 = 2623.00 FEET.

 FLOW PROCESS FROM NODE 53.00 TO NODE 54.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
 =====
 MAINLINE Tc(MIN) = 20.85
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.791
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL POOR COVER
 "OPEN BRUSH" B 9.40 0.45 1.00 76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 9.40 SUBAREA RUNOFF(CFS) = 11.33
 EFFECTIVE AREA(ACRES) = 37.20 AREA-AVERAGED Fm(INCH/HR) = 0.38
 AREA-AVERAGED Fp(INCH/HR) = 0.38 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 37.20 PEAK FLOW RATE(CFS) = 47.13

FLOW PROCESS FROM NODE 53.00 TO NODE 54.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 20.85
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.791
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL POOR COVER
"OPEN BRUSH" C 3.00 0.31 1.00 84
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.31
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 3.00 SUBAREA RUNOFF(CFS) = 4.01
EFFECTIVE AREA(ACRES) = 40.20 AREA-AVERAGED Fm(INCH/HR) = 0.38
AREA-AVERAGED Fp(INCH/HR) = 0.38 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 40.20 PEAK FLOW RATE(CFS) = 51.14

FLOW PROCESS FROM NODE 54.00 TO NODE 54.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 20.85
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.791
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL B 1.45 0.75 0.10 56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
SUBAREA AREA(ACRES) = 1.45 SUBAREA RUNOFF(CFS) = 2.24
EFFECTIVE AREA(ACRES) = 41.65 AREA-AVERAGED Fm(INCH/HR) = 0.37
AREA-AVERAGED Fp(INCH/HR) = 0.38 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 41.65 PEAK FLOW RATE(CFS) = 53.38

FLOW PROCESS FROM NODE 54.00 TO NODE 54.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 20.85
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.791
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"2 DWELLINGS/ACRE" B 16.10 0.75 0.70 56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
SUBAREA AREA(ACRES) = 16.10 SUBAREA RUNOFF(CFS) = 18.37
EFFECTIVE AREA(ACRES) = 57.75 AREA-AVERAGED Fm(INCH/HR) = 0.41
AREA-AVERAGED Fp(INCH/HR) = 0.46 AREA-AVERAGED Ap = 0.89
TOTAL AREA(ACRES) = 57.75 PEAK FLOW RATE(CFS) = 71.75

FLOW PROCESS FROM NODE 54.00 TO NODE 54.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 20.85
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.791
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL POOR COVER
"OPEN BRUSH" B 2.65 0.45 1.00 76
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 2.65 SUBAREA RUNOFF(CFS) = 3.19
EFFECTIVE AREA(ACRES) = 60.40 AREA-AVERAGED Fm(INCH/HR) = 0.41
AREA-AVERAGED Fp(INCH/HR) = 0.46 AREA-AVERAGED Ap = 0.90
TOTAL AREA(ACRES) = 60.40 PEAK FLOW RATE(CFS) = 74.94

FLOW PROCESS FROM NODE 54.00 TO NODE 54.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 20.85
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.791
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL POOR COVER
"OPEN BRUSH" C 8.10 0.31 1.00 84
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.31
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 8.10 SUBAREA RUNOFF(CFS) = 10.81
EFFECTIVE AREA(ACRES) = 68.50 AREA-AVERAGED Fm(INCH/HR) = 0.40
AREA-AVERAGED Fp(INCH/HR) = 0.44 AREA-AVERAGED Ap = 0.91
TOTAL AREA(ACRES) = 68.50 PEAK FLOW RATE(CFS) = 85.76

FLOW PROCESS FROM NODE 54.00 TO NODE 55.00 IS CODE = 61

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

=====

UPSTREAM ELEVATION(FEET) = 1005.00 DOWNSTREAM ELEVATION(FEET) = 1002.00
STREET LENGTH(FEET) = 456.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 25.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0149
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 85.94
STREET FLOWING FULL
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.80
HALFSTREET FLOOD WIDTH(FEET) = 31.57
AVERAGE FLOW VELOCITY(FEET/SEC.) = 4.15
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.31
STREET FLOW TRAVEL TIME(MIN.) = 1.83 Tc(MIN.) = 22.68
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.703
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL B 0.25 0.75 0.10 56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
SUBAREA AREA(ACRES) = 0.25 SUBAREA RUNOFF(CFS) = 0.37
EFFECTIVE AREA(ACRES) = 68.75 AREA-AVERAGED Fm(INCH/HR) = 0.44
AREA-AVERAGED Fp(INCH/HR) = 0.44 AREA-AVERAGED Ap = 0.91
TOTAL AREA(ACRES) = 68.75 PEAK FLOW RATE(CFS) = 85.76
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.80 HALFSTREET FLOOD WIDTH(FEET) = 31.51
FLOW VELOCITY(FEET/SEC.) = 4.15 DEPTH*VELOCITY(FT*FT/SEC.) = 3.31
LONGEST FLOWPATH FROM NODE 50.00 TO NODE 55.00 = 3079.00 FEET.

FLOW PROCESS FROM NODE 54.00 TO NODE 55.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN) = 22.68
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.703
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL B 7.65 0.75 0.70 56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
SUBAREA AREA(ACRES) = 7.65 SUBAREA RUNOFF(CFS) = 8.12
EFFECTIVE AREA(ACRES) = 76.40 AREA-AVERAGED Fm(INCH/HR) = 0.41
AREA-AVERAGED Fp(INCH/HR) = 0.46 AREA-AVERAGED Ap = 0.89
TOTAL AREA(ACRES) = 76.40 PEAK FLOW RATE(CFS) = 88.80

FLOW PROCESS FROM NODE 55.00 TO NODE 56.00 IS CODE = 61

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

=====

UPSTREAM ELEVATION(FEET) = 1002.00 DOWNSTREAM ELEVATION(FEET) = 925.00
STREET LENGTH(FEET) = 820.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 25.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0149
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 89.65
STREET FLOW SPLITS OVER STREET-CROWN
FULL DEPTH(FEET) = 0.66 FLOOD WIDTH(FEET) = 25.00
FULL HALF-STREET VELOCITY(FEET/SEC.) = 12.15
SPLIT DEPTH(FEET) = 0.39 SPLIT FLOOD WIDTH(FEET) = 11.37
SPLIT FLOW(CFS) = 11.44 SPLIT VELOCITY(FEET/SEC.) = 7.72
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.66
HALFSTREET FLOOD WIDTH(FEET) = 25.00
AVERAGE FLOW VELOCITY(FEET/SEC.) = 12.15
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.99
STREET FLOW TRAVEL TIME(MIN.) = 1.13 Tc(MIN.) = 23.81
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.654
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL B 1.20 0.75 0.10 56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10

SUBAREA AREA (ACRES) = 1.20 SUBAREA RUNOFF (CFS) = 1.71
 EFFECTIVE AREA (ACRES) = 77.60 AREA-AVERAGED Fm (INCH/HR) = 0.41
 AREA-AVERAGED Fp (INCH/HR) = 0.46 AREA-AVERAGED Ap = 0.87
 TOTAL AREA (ACRES) = 77.60 PEAK FLOW RATE (CFS) = 88.80
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.66 HALFSTREET FLOOD WIDTH (FEET) = 25.00
 FLOW VELOCITY (FEET/SEC.) = 12.15 DEPTH*VELOCITY (FT*FT/SEC.) = 7.99
 LONGEST FLOWPATH FROM NODE 50.00 TO NODE 56.00 = 3899.00 FEET.

 FLOW PROCESS FROM NODE 55.00 TO NODE 56.00 IS CODE = 81

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

MAINLINE Tc (MIN) = 23.81
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.654
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL B 2.00 0.75 0.10 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA (ACRES) = 2.00 SUBAREA RUNOFF (CFS) = 2.84
 EFFECTIVE AREA (ACRES) = 79.60 AREA-AVERAGED Fm (INCH/HR) = 0.40
 AREA-AVERAGED Fp (INCH/HR) = 0.47 AREA-AVERAGED Ap = 0.86
 TOTAL AREA (ACRES) = 79.60 PEAK FLOW RATE (CFS) = 89.99

 FLOW PROCESS FROM NODE 55.00 TO NODE 56.00 IS CODE = 81

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

MAINLINE Tc (MIN) = 23.81
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.654
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 8.25 0.75 0.70 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
 SUBAREA AREA (ACRES) = 8.25 SUBAREA RUNOFF (CFS) = 8.40
 EFFECTIVE AREA (ACRES) = 87.85 AREA-AVERAGED Fm (INCH/HR) = 0.41
 AREA-AVERAGED Fp (INCH/HR) = 0.49 AREA-AVERAGED Ap = 0.84
 TOTAL AREA (ACRES) = 87.85 PEAK FLOW RATE (CFS) = 98.39

 FLOW PROCESS FROM NODE 55.00 TO NODE 56.00 IS CODE = 81

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

MAINLINE Tc (MIN) = 23.81
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.654
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 3.90 0.75 0.70 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
 SUBAREA AREA (ACRES) = 3.90 SUBAREA RUNOFF (CFS) = 3.97
 EFFECTIVE AREA (ACRES) = 91.75 AREA-AVERAGED Fm (INCH/HR) = 0.41
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.83
 TOTAL AREA (ACRES) = 91.75 PEAK FLOW RATE (CFS) = 102.36

 FLOW PROCESS FROM NODE 55.00 TO NODE 56.00 IS CODE = 81

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

MAINLINE Tc (MIN) = 23.81
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.654
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 8.20 0.75 0.70 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
 SUBAREA AREA (ACRES) = 8.20 SUBAREA RUNOFF (CFS) = 8.34
 EFFECTIVE AREA (ACRES) = 99.95 AREA-AVERAGED Fm (INCH/HR) = 0.42
 AREA-AVERAGED Fp (INCH/HR) = 0.51 AREA-AVERAGED Ap = 0.82
 TOTAL AREA (ACRES) = 99.95 PEAK FLOW RATE (CFS) = 110.70

 FLOW PROCESS FROM NODE 55.00 TO NODE 56.00 IS CODE = 81

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

MAINLINE Tc (MIN) = 23.81
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.654
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" C 1.15 0.57 0.70 69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.57

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
 SUBAREA AREA(ACRES) = 1.15 SUBAREA RUNOFF(CFS) = 1.30
 EFFECTIVE AREA(ACRES) = 101.10 AREA-AVERAGED Fm (INCH/HR) = 0.42
 AREA-AVERAGED Fp (INCH/HR) = 0.51 AREA-AVERAGED Ap = 0.82
 TOTAL AREA(ACRES) = 101.10 PEAK FLOW RATE(CFS) = 112.00

 FLOW PROCESS FROM NODE 55.00 TO NODE 56.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 23.81
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.654
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL C 0.15 0.57 0.10 69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.57
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA(ACRES) = 0.15 SUBAREA RUNOFF(CFS) = 0.22
 EFFECTIVE AREA(ACRES) = 101.25 AREA-AVERAGED Fm (INCH/HR) = 0.42
 AREA-AVERAGED Fp (INCH/HR) = 0.51 AREA-AVERAGED Ap = 0.82
 TOTAL AREA(ACRES) = 101.25 PEAK FLOW RATE(CFS) = 112.22

 FLOW PROCESS FROM NODE 56.00 TO NODE 57.00 IS CODE = 61

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

UPSTREAM ELEVATION(FEET) = 925.00 DOWNSTREAM ELEVATION(FEET) = 914.45
 STREET LENGTH(FEET) = 777.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 40.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 35.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0149
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 113.07
 STREET FLOW SPLITS OVER STREET-CROWN
 FULL DEPTH(FEET) = 0.96 FLOOD WIDTH(FEET) = 54.58
 FULL HALF-STREET VELOCITY(FEET/SEC.) = 5.83
 SPLIT DEPTH(FEET) = 0.42 SPLIT FLOOD WIDTH(FEET) = 13.31
 SPLIT FLOW(CFS) = 6.24 SPLIT VELOCITY(FEET/SEC.) = 3.18
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.96
 HALFSTREET FLOOD WIDTH(FEET) = 54.58
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.83
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.59
 STREET FLOW TRAVEL TIME(MIN.) = 2.22 Tc(MIN.) = 26.03
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.568
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL C 1.25 0.57 0.10 69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.57
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA(ACRES) = 1.25 SUBAREA RUNOFF(CFS) = 1.70
 EFFECTIVE AREA(ACRES) = 102.50 AREA-AVERAGED Fm (INCH/HR) = 0.42
 AREA-AVERAGED Fp (INCH/HR) = 0.51 AREA-AVERAGED Ap = 0.81
 TOTAL AREA(ACRES) = 102.50 PEAK FLOW RATE(CFS) = 112.22
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.96 HALFSTREET FLOOD WIDTH(FEET) = 54.58
 FLOW VELOCITY(FEET/SEC.) = 5.83 DEPTH*VELOCITY(FT*FT/SEC.) = 5.59
 LONGEST FLOWPATH FROM NODE 50.00 TO NODE 57.00 = 4676.00 FEET.

 FLOW PROCESS FROM NODE 56.00 TO NODE 57.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 26.03
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.568
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL B 0.20 0.75 0.10 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA(ACRES) = 0.20 SUBAREA RUNOFF(CFS) = 0.27
 EFFECTIVE AREA(ACRES) = 102.70 AREA-AVERAGED Fm (INCH/HR) = 0.42
 AREA-AVERAGED Fp (INCH/HR) = 0.52 AREA-AVERAGED Ap = 0.81
 TOTAL AREA(ACRES) = 102.70 PEAK FLOW RATE(CFS) = 112.22
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 56.00 TO NODE 57.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 26.03
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.568

SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" C 2.80 0.57 0.70 69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.57
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
 SUBAREA AREA(ACRES) = 2.80 SUBAREA RUNOFF(CFS) = 2.95
 EFFECTIVE AREA(ACRES) = 105.50 AREA-AVERAGED Fm(INCH/HR) = 0.42
 AREA-AVERAGED Fp(INCH/HR) = 0.52 AREA-AVERAGED Ap = 0.81
 TOTAL AREA(ACRES) = 105.50 PEAK FLOW RATE(CFS) = 112.22
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 56.00 TO NODE 57.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 26.03
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.568
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL POOR COVER
 "OPEN BRUSH" B 0.15 0.45 1.00 76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 0.15 SUBAREA RUNOFF(CFS) = 0.15
 EFFECTIVE AREA(ACRES) = 105.65 AREA-AVERAGED Fm(INCH/HR) = 0.42
 AREA-AVERAGED Fp(INCH/HR) = 0.52 AREA-AVERAGED Ap = 0.81
 TOTAL AREA(ACRES) = 105.65 PEAK FLOW RATE(CFS) = 112.22
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 56.00 TO NODE 57.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 26.03
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.568
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH" C 0.05 0.43 1.00 77
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.43
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 0.05 SUBAREA RUNOFF(CFS) = 0.05
 EFFECTIVE AREA(ACRES) = 105.70 AREA-AVERAGED Fm(INCH/HR) = 0.42
 AREA-AVERAGED Fp(INCH/HR) = 0.52 AREA-AVERAGED Ap = 0.81
 TOTAL AREA(ACRES) = 105.70 PEAK FLOW RATE(CFS) = 112.22
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 57.00 TO NODE 58.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 906.40 DOWNSTREAM(FEET) = 906.17
 FLOW LENGTH(FEET) = 46.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 51.0 INCH PIPE IS 40.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 9.34
 ESTIMATED PIPE DIAMETER(INCH) = 51.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 112.22
 PIPE TRAVEL TIME(MIN.) = 0.08 Tc(MIN.) = 26.11
 LONGEST FLOWPATH FROM NODE 50.00 TO NODE 58.00 = 4722.00 FEET.

 FLOW PROCESS FROM NODE 58.00 TO NODE 58.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 26.11
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.565
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" C 0.65 0.57 0.70 69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.57
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
 SUBAREA AREA(ACRES) = 0.65 SUBAREA RUNOFF(CFS) = 0.68
 EFFECTIVE AREA(ACRES) = 106.35 AREA-AVERAGED Fm(INCH/HR) = 0.42
 AREA-AVERAGED Fp(INCH/HR) = 0.52 AREA-AVERAGED Ap = 0.81
 TOTAL AREA(ACRES) = 106.35 PEAK FLOW RATE(CFS) = 112.22
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 58.00 TO NODE 58.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 26.11
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.565
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER

"OPEN BRUSH" C 0.75 0.43 1.00 77
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.43
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 0.75 SUBAREA RUNOFF(CFS) = 0.76
 EFFECTIVE AREA(ACRES) = 107.10 AREA-AVERAGED Fm(INCH/HR) = 0.42
 AREA-AVERAGED Fp(INCH/HR) = 0.52 AREA-AVERAGED Ap = 0.81
 TOTAL AREA(ACRES) = 107.10 PEAK FLOW RATE(CFS) = 112.22
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 58.00 TO NODE 59.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 906.17 DOWNSTREAM(FEET) = 903.68
 FLOW LENGTH(FEET) = 497.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 51.0 INCH PIPE IS 40.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 9.35
 ESTIMATED PIPE DIAMETER(INCH) = 51.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 112.22
 PIPE TRAVEL TIME(MIN.) = 0.89 Tc(MIN.) = 26.99
 LONGEST FLOWPATH FROM NODE 50.00 TO NODE 59.00 = 5219.00 FEET.

 FLOW PROCESS FROM NODE 59.00 TO NODE 59.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 26.99
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.534
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL B 0.25 0.75 0.10 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA(ACRES) = 0.25 SUBAREA RUNOFF(CFS) = 0.33
 EFFECTIVE AREA(ACRES) = 107.35 AREA-AVERAGED Fm(INCH/HR) = 0.42
 AREA-AVERAGED Fp(INCH/HR) = 0.52 AREA-AVERAGED Ap = 0.81
 TOTAL AREA(ACRES) = 107.35 PEAK FLOW RATE(CFS) = 112.22
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 59.00 TO NODE 59.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 26.99
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.534
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL A 0.35 0.98 0.10 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA(ACRES) = 0.35 SUBAREA RUNOFF(CFS) = 0.45
 EFFECTIVE AREA(ACRES) = 107.70 AREA-AVERAGED Fm(INCH/HR) = 0.42
 AREA-AVERAGED Fp(INCH/HR) = 0.52 AREA-AVERAGED Ap = 0.81
 TOTAL AREA(ACRES) = 107.70 PEAK FLOW RATE(CFS) = 112.22
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 59.00 TO NODE 59.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 26.99
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.534
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH" B 0.15 0.61 1.00 66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 0.15 SUBAREA RUNOFF(CFS) = 0.12
 EFFECTIVE AREA(ACRES) = 107.85 AREA-AVERAGED Fm(INCH/HR) = 0.42
 AREA-AVERAGED Fp(INCH/HR) = 0.52 AREA-AVERAGED Ap = 0.81
 TOTAL AREA(ACRES) = 107.85 PEAK FLOW RATE(CFS) = 112.22
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 59.00 TO NODE 59.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 26.99
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.534
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH" A 0.05 0.86 1.00 46
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 0.05 SUBAREA RUNOFF(CFS) = 0.03
 EFFECTIVE AREA(ACRES) = 107.90 AREA-AVERAGED Fm(INCH/HR) = 0.42
 AREA-AVERAGED Fp(INCH/HR) = 0.52 AREA-AVERAGED Ap = 0.81

TOTAL AREA(ACRES) = 107.90 PEAK FLOW RATE(CFS) = 112.22
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

FLOW PROCESS FROM NODE 59.00 TO NODE 60.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 903.68 DOWNSTREAM(FEET) = 901.77
FLOW LENGTH(FEET) = 383.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 51.0 INCH PIPE IS 40.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 9.33
ESTIMATED PIPE DIAMETER(INCH) = 51.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 112.22
PIPE TRAVEL TIME(MIN.) = 0.68 Tc(MIN.) = 27.68
LONGEST FLOWPATH FROM NODE 50.00 TO NODE 60.00 = 5602.00 FEET.

FLOW PROCESS FROM NODE 60.00 TO NODE 60.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 27.68
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.511
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL A 0.40 0.98 0.10 32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
SUBAREA AREA(ACRES) = 0.40 SUBAREA RUNOFF(CFS) = 0.51
EFFECTIVE AREA(ACRES) = 108.30 AREA-AVERAGED Fm(INCH/HR) = 0.41
AREA-AVERAGED Fp(INCH/HR) = 0.52 AREA-AVERAGED Ap = 0.80
TOTAL AREA(ACRES) = 108.30 PEAK FLOW RATE(CFS) = 112.22
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

FLOW PROCESS FROM NODE 60.00 TO NODE 60.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 27.68
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.511
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL B 0.15 0.75 0.10 56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
SUBAREA AREA(ACRES) = 0.15 SUBAREA RUNOFF(CFS) = 0.19
EFFECTIVE AREA(ACRES) = 108.45 AREA-AVERAGED Fm(INCH/HR) = 0.41
AREA-AVERAGED Fp(INCH/HR) = 0.52 AREA-AVERAGED Ap = 0.80
TOTAL AREA(ACRES) = 108.45 PEAK FLOW RATE(CFS) = 112.22
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

FLOW PROCESS FROM NODE 60.00 TO NODE 60.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 27.68
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.511
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"OPEN BRUSH" A 0.20 0.86 1.00 46
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 0.20 SUBAREA RUNOFF(CFS) = 0.12
EFFECTIVE AREA(ACRES) = 108.65 AREA-AVERAGED Fm(INCH/HR) = 0.41
AREA-AVERAGED Fp(INCH/HR) = 0.52 AREA-AVERAGED Ap = 0.80
TOTAL AREA(ACRES) = 108.65 PEAK FLOW RATE(CFS) = 112.22
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

FLOW PROCESS FROM NODE 60.00 TO NODE 60.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 27.68
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.511
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"OPEN BRUSH" B 0.15 0.61 1.00 66
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 0.15 SUBAREA RUNOFF(CFS) = 0.12
EFFECTIVE AREA(ACRES) = 108.80 AREA-AVERAGED Fm(INCH/HR) = 0.42
AREA-AVERAGED Fp(INCH/HR) = 0.52 AREA-AVERAGED Ap = 0.80
TOTAL AREA(ACRES) = 108.80 PEAK FLOW RATE(CFS) = 112.22
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

FLOW PROCESS FROM NODE 60.00 TO NODE 61.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM (FEET) = 901.77 DOWNSTREAM (FEET) = 898.42
FLOW LENGTH (FEET) = 530.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 51.0 INCH PIPE IS 36.4 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) = 10.37
ESTIMATED PIPE DIAMETER (INCH) = 51.00 NUMBER OF PIPES = 1
PIPE-FLOW (CFS) = 112.22
PIPE TRAVEL TIME (MIN.) = 0.85 Tc (MIN.) = 28.53
LONGEST FLOWPATH FROM NODE 50.00 TO NODE 61.00 = 6132.00 FEET.

FLOW PROCESS FROM NODE 61.00 TO NODE 61.00 IS CODE = 81

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

=====

MAINLINE Tc (MIN) = 28.53
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.484
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	0.40	0.75	0.10	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
SUBAREA AREA (ACRES) = 0.40 SUBAREA RUNOFF (CFS) = 0.51
EFFECTIVE AREA (ACRES) = 109.20 AREA-AVERAGED Fm (INCH/HR) = 0.41
AREA-AVERAGED Fp (INCH/HR) = 0.52 AREA-AVERAGED Ap = 0.80
TOTAL AREA (ACRES) = 109.20 PEAK FLOW RATE (CFS) = 112.22
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

FLOW PROCESS FROM NODE 61.00 TO NODE 61.00 IS CODE = 81

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

=====

MAINLINE Tc (MIN) = 28.53
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.484
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	0.30	0.75	0.10	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
SUBAREA AREA (ACRES) = 0.30 SUBAREA RUNOFF (CFS) = 0.38
EFFECTIVE AREA (ACRES) = 109.50 AREA-AVERAGED Fm (INCH/HR) = 0.41
AREA-AVERAGED Fp (INCH/HR) = 0.52 AREA-AVERAGED Ap = 0.80
TOTAL AREA (ACRES) = 109.50 PEAK FLOW RATE (CFS) = 112.22
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

FLOW PROCESS FROM NODE 61.00 TO NODE 61.00 IS CODE = 81

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

=====

MAINLINE Tc (MIN) = 28.53
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.484
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "OPEN BRUSH"	B	0.30	0.61	1.00	66

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.61
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA (ACRES) = 0.30 SUBAREA RUNOFF (CFS) = 0.23
EFFECTIVE AREA (ACRES) = 109.80 AREA-AVERAGED Fm (INCH/HR) = 0.41
AREA-AVERAGED Fp (INCH/HR) = 0.52 AREA-AVERAGED Ap = 0.80
TOTAL AREA (ACRES) = 109.80 PEAK FLOW RATE (CFS) = 112.22
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

FLOW PROCESS FROM NODE 61.00 TO NODE 61.00 IS CODE = 81

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

=====

MAINLINE Tc (MIN) = 28.53
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.484
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	0.60	0.75	0.10	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
SUBAREA AREA (ACRES) = 0.60 SUBAREA RUNOFF (CFS) = 0.76
EFFECTIVE AREA (ACRES) = 110.40 AREA-AVERAGED Fm (INCH/HR) = 0.41
AREA-AVERAGED Fp (INCH/HR) = 0.52 AREA-AVERAGED Ap = 0.79
TOTAL AREA (ACRES) = 110.40 PEAK FLOW RATE (CFS) = 112.22
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

FLOW PROCESS FROM NODE 61.00 TO NODE 61.00 IS CODE = 81

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

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MAINLINE Tc (MIN) = 28.53
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.484
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	0.60	0.75	0.10	56

COMMERCIAL A 0.15 0.98 0.10 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA (ACRES) = 0.15 SUBAREA RUNOFF (CFS) = 0.19
 EFFECTIVE AREA (ACRES) = 110.55 AREA-AVERAGED Fm (INCH/HR) = 0.41
 AREA-AVERAGED Fp (INCH/HR) = 0.52 AREA-AVERAGED Ap = 0.79
 TOTAL AREA (ACRES) = 110.55 PEAK FLOW RATE (CFS) = 112.22
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 61.00 TO NODE 61.00 IS CODE = 81

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

MAINLINE Tc (MIN) = 28.53
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.484
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH" B 0.15 0.61 1.00 66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA (ACRES) = 0.15 SUBAREA RUNOFF (CFS) = 0.12
 EFFECTIVE AREA (ACRES) = 110.70 AREA-AVERAGED Fm (INCH/HR) = 0.41
 AREA-AVERAGED Fp (INCH/HR) = 0.52 AREA-AVERAGED Ap = 0.79
 TOTAL AREA (ACRES) = 110.70 PEAK FLOW RATE (CFS) = 112.22
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 61.00 TO NODE 61.00 IS CODE = 81

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

MAINLINE Tc (MIN) = 28.53
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.484
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL B 0.50 0.75 0.10 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA (ACRES) = 0.50 SUBAREA RUNOFF (CFS) = 0.63
 EFFECTIVE AREA (ACRES) = 111.20 AREA-AVERAGED Fm (INCH/HR) = 0.41
 AREA-AVERAGED Fp (INCH/HR) = 0.52 AREA-AVERAGED Ap = 0.79
 TOTAL AREA (ACRES) = 111.20 PEAK FLOW RATE (CFS) = 112.22
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 61.00 TO NODE 61.00 IS CODE = 81

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

MAINLINE Tc (MIN) = 28.53
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.484
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL C 0.05 0.57 0.10 69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.57
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA (ACRES) = 0.05 SUBAREA RUNOFF (CFS) = 0.06
 EFFECTIVE AREA (ACRES) = 111.25 AREA-AVERAGED Fm (INCH/HR) = 0.41
 AREA-AVERAGED Fp (INCH/HR) = 0.52 AREA-AVERAGED Ap = 0.79
 TOTAL AREA (ACRES) = 111.25 PEAK FLOW RATE (CFS) = 112.22
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 61.00 TO NODE 61.00 IS CODE = 81

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

MAINLINE Tc (MIN) = 28.53
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.484
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH" A 0.20 0.86 1.00 46
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA (ACRES) = 0.20 SUBAREA RUNOFF (CFS) = 0.11
 EFFECTIVE AREA (ACRES) = 111.45 AREA-AVERAGED Fm (INCH/HR) = 0.41
 AREA-AVERAGED Fp (INCH/HR) = 0.52 AREA-AVERAGED Ap = 0.79
 TOTAL AREA (ACRES) = 111.45 PEAK FLOW RATE (CFS) = 112.22
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 61.00 TO NODE 73.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM (FEET) = 898.42 DOWNSTREAM (FEET) = 895.00
 FLOW LENGTH (FEET) = 132.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 39.0 INCH PIPE IS 28.0 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 17.58
 ESTIMATED PIPE DIAMETER (INCH) = 39.00 NUMBER OF PIPES = 1
 PIPE-FLOW (CFS) = 112.22

PIPE TRAVEL TIME(MIN.) = 0.13 Tc(MIN.) = 28.66
LONGEST FLOWPATH FROM NODE 50.00 TO NODE 73.00 = 6264.00 FEET.

FLOW PROCESS FROM NODE 73.00 TO NODE 73.00 IS CODE = 10

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

FLOW PROCESS FROM NODE 70.00 TO NODE 71.00 IS CODE = 21

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 570.00
ELEVATION DATA: UPSTREAM(FEET) = 950.00 DOWNSTREAM(FEET) = 919.00

Tc = K * [(LENGTH** 3.00) / (ELEVATION CHANGE)] ** 0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 6.889
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.481
SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
COMMERCIAL C 0.05 0.57 0.10 69 6.89
COMMERCIAL B 0.15 0.75 0.10 56 6.89
NATURAL FAIR COVER
"OPEN BRUSH" B 0.05 0.61 1.00 66 16.00
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.28
SUBAREA RUNOFF(CFS) = 0.74
TOTAL AREA(ACRES) = 0.25 PEAK FLOW RATE(CFS) = 0.74

FLOW PROCESS FROM NODE 70.00 TO NODE 71.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 6.89
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.481
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"2 DWELLINGS/ACRE" C 3.15 0.57 0.70 69
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.57
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
SUBAREA AREA(ACRES) = 3.15 SUBAREA RUNOFF(CFS) = 8.75
EFFECTIVE AREA(ACRES) = 3.40 AREA-AVERAGED Fm(INCH/HR) = 0.38
AREA-AVERAGED Fp(INCH/HR) = 0.57 AREA-AVERAGED Ap = 0.67
TOTAL AREA(ACRES) = 3.40 PEAK FLOW RATE(CFS) = 9.49

FLOW PROCESS FROM NODE 70.00 TO NODE 71.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 6.89
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.481
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"2 DWELLINGS/ACRE" B 1.85 0.75 0.70 56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
SUBAREA AREA(ACRES) = 1.85 SUBAREA RUNOFF(CFS) = 4.92
EFFECTIVE AREA(ACRES) = 5.25 AREA-AVERAGED Fm(INCH/HR) = 0.43
AREA-AVERAGED Fp(INCH/HR) = 0.63 AREA-AVERAGED Ap = 0.68
TOTAL AREA(ACRES) = 5.25 PEAK FLOW RATE(CFS) = 14.41

FLOW PROCESS FROM NODE 71.00 TO NODE 72.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 913.00 DOWNSTREAM(FEET) = 896.00
FLOW LENGTH(FEET) = 70.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 12.0 INCH PIPE IS 8.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 24.43
ESTIMATED PIPE DIAMETER(INCH) = 12.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 14.41
PIPE TRAVEL TIME(MIN.) = 0.05 Tc(MIN.) = 6.94
LONGEST FLOWPATH FROM NODE 70.00 TO NODE 72.00 = 640.00 FEET.

FLOW PROCESS FROM NODE 72.00 TO NODE 72.00 IS CODE = 1

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

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 6.94
RAINFALL INTENSITY(INCH/HR) = 3.47
AREA-AVERAGED Fm(INCH/HR) = 0.43
AREA-AVERAGED Fp(INCH/HR) = 0.63
AREA-AVERAGED Ap = 0.68
EFFECTIVE STREAM AREA(ACRES) = 5.25

TOTAL STREAM AREA(ACRES) = 5.25
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 14.41

FLOW PROCESS FROM NODE 72.00 TO NODE 72.00 IS CODE = 7

>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<

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USER-SPECIFIED VALUES ARE AS FOLLOWS:

TC(MIN.) = 12.94 RAINFALL INTENSITY(INCH/HR) = 2.38
 EFFECTIVE AREA(ACRES) = 27.52
 TOTAL AREA(ACRES) = 30.45 PEAK FLOW RATE(CFS) = 52.97
 AREA-AVERAGED Fm(INCH/HR) = 0.31 AREA-AVERAGED Fp(INCH/HR) = 0.66
 AREA-AVERAGED Ap = 0.47

NOTE: EFFECTIVE AREA IS USED AS THE TOTAL CONTRIBUTING AREA FOR ALL
 CONFLUENCE ANALYSES.

FLOW PROCESS FROM NODE 72.00 TO NODE 72.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 12.94
 RAINFALL INTENSITY(INCH/HR) = 2.38
 AREA-AVERAGED Fm(INCH/HR) = 0.31
 AREA-AVERAGED Fp(INCH/HR) = 0.66
 AREA-AVERAGED Ap = 0.47
 EFFECTIVE STREAM AREA(ACRES) = 27.52
 TOTAL STREAM AREA(ACRES) = 30.45
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 52.97

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14.41	6.94	3.467	0.63 (0.43)	0.68	5.3	70.00
2	52.97	12.94	2.385	0.66 (0.31)	0.47	27.5	72.00

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	57.62	6.94	3.467	0.65 (0.34)	0.53	20.0	70.00
2	62.25	12.94	2.385	0.65 (0.33)	0.50	32.8	72.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 62.25 Tc(MIN.) = 12.94
 EFFECTIVE AREA(ACRES) = 32.77 AREA-AVERAGED Fm(INCH/HR) = 0.33
 AREA-AVERAGED Fp(INCH/HR) = 0.65 AREA-AVERAGED Ap = 0.50
 TOTAL AREA(ACRES) = 35.70
 LONGEST FLOWPATH FROM NODE 70.00 TO NODE 72.00 = 640.00 FEET.

FLOW PROCESS FROM NODE 72.00 TO NODE 73.00 IS CODE = 31

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

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ELEVATION DATA: UPSTREAM(FEET) = 896.00 DOWNSTREAM(FEET) = 895.00
 FLOW LENGTH(FEET) = 89.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 26.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 11.04
 ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 62.25
 PIPE TRAVEL TIME(MIN.) = 0.13 Tc(MIN.) = 13.07
 LONGEST FLOWPATH FROM NODE 70.00 TO NODE 73.00 = 729.00 FEET.

FLOW PROCESS FROM NODE 73.00 TO NODE 73.00 IS CODE = 11

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

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	57.62	7.07	3.427	0.65 (0.34)	0.53	20.0	70.00
2	62.25	13.07	2.370	0.65 (0.33)	0.50	32.8	72.00

LONGEST FLOWPATH FROM NODE 70.00 TO NODE 73.00 = 729.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	112.22	28.66	1.480	0.52 (0.41)	0.79	111.5	50.00

LONGEST FLOWPATH FROM NODE 0.00 TO NODE 73.00 = 0.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	135.73	7.07	3.427	0.56 (0.38)	0.68	47.5	70.00
2	156.06	13.07	2.370	0.56 (0.38)	0.68	83.6	72.00
3	147.32	28.66	1.480	0.54 (0.39)	0.73	144.2	50.00

TOTAL AREA(ACRES) = 147.15

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 156.06 Tc(MIN.) = 13.074
 EFFECTIVE AREA(ACRES) = 83.62 AREA-AVERAGED Fm(INCH/HR) = 0.38
 AREA-AVERAGED Fp(INCH/HR) = 0.56 AREA-AVERAGED Ap = 0.68
 TOTAL AREA(ACRES) = 147.15
 LONGEST FLOWPATH FROM NODE 70.00 TO NODE 73.00 = 729.00 FEET.

 FLOW PROCESS FROM NODE 73.00 TO NODE 73.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

 FLOW PROCESS FROM NODE 73.00 TO NODE 74.00 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) = 891.87
 FLOW LENGTH(FEET) = 121.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 42.0 INCH PIPE IS 34.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 18.69
 ESTIMATED PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 156.06
 PIPE TRAVEL TIME(MIN.) = 0.11 Tc(MIN.) = 13.18
 LONGEST FLOWPATH FROM NODE 70.00 TO NODE 74.00 = 850.00 FEET.

 FLOW PROCESS FROM NODE 74.00 TO NODE 74.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 13.18
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.358
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	1.20	0.75	0.10	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA(ACRES) = 1.20 SUBAREA RUNOFF(CFS) = 2.47
 EFFECTIVE AREA(ACRES) = 84.82 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp(INCH/HR) = 0.56 AREA-AVERAGED Ap = 0.67
 TOTAL AREA(ACRES) = 148.35 PEAK FLOW RATE(CFS) = 156.06
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 74.00 TO NODE 74.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 13.18
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.358
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	A	0.40	0.98	0.10	32

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA(ACRES) = 0.40 SUBAREA RUNOFF(CFS) = 0.81
 EFFECTIVE AREA(ACRES) = 85.22 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp(INCH/HR) = 0.56 AREA-AVERAGED Ap = 0.67
 TOTAL AREA(ACRES) = 148.75 PEAK FLOW RATE(CFS) = 156.06
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 74.00 TO NODE 74.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 13.18
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.358
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "OPEN BRUSH"	A	0.10	0.86	1.00	46

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 0.10 SUBAREA RUNOFF(CFS) = 0.13
 EFFECTIVE AREA(ACRES) = 85.32 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp(INCH/HR) = 0.56 AREA-AVERAGED Ap = 0.67
 TOTAL AREA(ACRES) = 148.85 PEAK FLOW RATE(CFS) = 156.06
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 74.00 TO NODE 74.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 13.18
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.358
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	0.30	0.75	0.10	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA(ACRES) = 0.30 SUBAREA RUNOFF(CFS) = 0.62

EFFECTIVE AREA(ACRES) = 85.62 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp(INCH/HR) = 0.56 AREA-AVERAGED Ap = 0.67
 TOTAL AREA(ACRES) = 149.15 PEAK FLOW RATE(CFS) = 156.06
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 74.00 TO NODE 74.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 13.18
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.358
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH" B 0.10 0.61 1.00 66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 0.10 SUBAREA RUNOFF(CFS) = 0.16
 EFFECTIVE AREA(ACRES) = 85.72 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp(INCH/HR) = 0.56 AREA-AVERAGED Ap = 0.67
 TOTAL AREA(ACRES) = 149.25 PEAK FLOW RATE(CFS) = 156.06
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 74.00 TO NODE 75.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 891.87 DOWNSTREAM(FEET) = 887.60
 FLOW LENGTH(FEET) = 165.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 42.0 INCH PIPE IS 34.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 18.69
 ESTIMATED PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 156.06
 PIPE TRAVEL TIME(MIN.) = 0.15 Tc(MIN.) = 13.33
 LONGEST FLOWPATH FROM NODE 70.00 TO NODE 75.00 = 1015.00 FEET.

END OF STUDY SUMMARY:
 TOTAL AREA(ACRES) = 149.25 TC(MIN.) = 13.33
 EFFECTIVE AREA(ACRES) = 85.72 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp(INCH/HR) = 0.56 AREA-AVERAGED Ap = 0.67
 PEAK FLOW RATE(CFS) = 156.06

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	135.73	7.33	3.354	0.56 (0.37)	0.66	49.6	70.00
2	156.06	13.33	2.343	0.56 (0.37)	0.67	85.7	72.00
3	147.32	28.91	1.472	0.54 (0.39)	0.72	146.3	50.00

END OF RATIONAL METHOD ANALYSIS

100-YEAR FREQUENCY

Analysis prepared by:

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***** DESCRIPTION OF STUDY *****
* LA CADENA DR COLTON, SAN BERNARDINO COUNTY *
* 100-YEAR PROPOSED CONDITION *
* ONSITE SD NODES 30-72 *

FILE NAME: C:\XDRIVE\3535\100P1.DAT
TIME/DATE OF STUDY: 14:09 04/12/2017

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

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

USER SPECIFIED STORM EVENT (YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE (INCH) = 12.00
SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL

SLOPE OF INTENSITY DURATION CURVE (LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
USER SPECIFIED 1-HOUR INTENSITY (INCH/HOUR) = 1.2000

ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD

FLOW PROCESS FROM NODE 30.00 TO NODE 31.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH (FEET) = 776.00
ELEVATION DATA: UPSTREAM (FEET) = 918.37 DOWNSTREAM (FEET) = 909.49

Tc = K * [(LENGTH** 3.00) / (ELEVATION CHANGE)] ** 0.20
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 10.644
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.387
SUBAREA Tc AND LOSS RATE DATA (AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL	A	0.60	0.80	0.10	52	10.64

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.80
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
SUBAREA RUNOFF (CFS) = 1.79
TOTAL AREA (ACRES) = 0.60 PEAK FLOW RATE (CFS) = 1.79

FLOW PROCESS FROM NODE 30.00 TO NODE 31.00 IS CODE = 81

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

=====

MAINLINE Tc (MIN) = 10.64
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.387
SUBAREA LOSS RATE DATA (AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	2.05	0.45	0.10	76

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.45
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
SUBAREA AREA (ACRES) = 2.05 SUBAREA RUNOFF (CFS) = 6.17
EFFECTIVE AREA (ACRES) = 2.65 AREA-AVERAGED Fm (INCH/HR) = 0.05
AREA-AVERAGED Fp (INCH/HR) = 0.53 AREA-AVERAGED Ap = 0.10
TOTAL AREA (ACRES) = 2.65 PEAK FLOW RATE (CFS) = 7.95

FLOW PROCESS FROM NODE 30.00 TO NODE 31.00 IS CODE = 81

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

=====

MAINLINE Tc (MIN) = 10.64
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.387
SUBAREA LOSS RATE DATA (AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "OPEN BRUSH"	C	0.60	0.16	1.00	92

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.16
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA (ACRES) = 0.60 SUBAREA RUNOFF (CFS) = 1.74
EFFECTIVE AREA (ACRES) = 3.25 AREA-AVERAGED Fm (INCH/HR) = 0.07
AREA-AVERAGED Fp (INCH/HR) = 0.27 AREA-AVERAGED Ap = 0.27
TOTAL AREA (ACRES) = 3.25 PEAK FLOW RATE (CFS) = 9.69

FLOW PROCESS FROM NODE 30.00 TO NODE 31.00 IS CODE = 81

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

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=====
MAINLINE Tc(MIN) = 10.64
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.387
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
  LAND USE          GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
RESIDENTIAL
"2 DWELLINGS/ACRE"   C         0.40     0.27     0.70     86
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
SUBAREA AREA(ACRES) = 0.40     SUBAREA RUNOFF(CFS) = 1.15
EFFECTIVE AREA(ACRES) = 3.65   AREA-AVERAGED Fm(INCH/HR) = 0.09
AREA-AVERAGED Fp(INCH/HR) = 0.27   AREA-AVERAGED Ap = 0.31
TOTAL AREA(ACRES) = 3.65     PEAK FLOW RATE(CFS) = 10.84

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*****
FLOW PROCESS FROM NODE 30.00 TO NODE 31.00 IS CODE = 81
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>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

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=====
MAINLINE Tc(MIN) = 10.64
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.387
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
  LAND USE          GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
NATURAL FAIR COVER
"OPEN BRUSH"        B         0.30     0.31     1.00     84
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.31
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 0.30     SUBAREA RUNOFF(CFS) = 0.83
EFFECTIVE AREA(ACRES) = 3.95   AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.28   AREA-AVERAGED Ap = 0.37
TOTAL AREA(ACRES) = 3.95     PEAK FLOW RATE(CFS) = 11.68

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*****
FLOW PROCESS FROM NODE 31.00 TO NODE 32.00 IS CODE = 31
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>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

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=====
ELEVATION DATA: UPSTREAM( FEET) = 904.80  DOWNSTREAM( FEET) = 900.83
FLOW LENGTH( FEET) = 265.00  MANNING'S N = 0.012
DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.9 INCHES
PIPE-FLOW VELOCITY( FEET/SEC.) = 8.64
ESTIMATED PIPE DIAMETER( INCH) = 18.00  NUMBER OF PIPES = 1
PIPE-FLOW( CFS) = 11.68
PIPE TRAVEL TIME( MIN.) = 0.51  Tc( MIN.) = 11.16
LONGEST FLOWPATH FROM NODE 30.00 TO NODE 32.00 = 1041.00 FEET.

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*****
FLOW PROCESS FROM NODE 32.00 TO NODE 32.00 IS CODE = 81
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>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

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=====
MAINLINE Tc(MIN) = 11.16
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.293
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
  LAND USE          GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
NATURAL FAIR COVER
"OPEN BRUSH"        B         0.20     0.31     1.00     84
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.31
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 0.20     SUBAREA RUNOFF(CFS) = 0.54
EFFECTIVE AREA(ACRES) = 4.15   AREA-AVERAGED Fm(INCH/HR) = 0.11
AREA-AVERAGED Fp(INCH/HR) = 0.28   AREA-AVERAGED Ap = 0.40
TOTAL AREA(ACRES) = 4.15     PEAK FLOW RATE(CFS) = 11.88

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*****
FLOW PROCESS FROM NODE 32.00 TO NODE 32.00 IS CODE = 81
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>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

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=====
MAINLINE Tc(MIN) = 11.16
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.293
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
  LAND USE          GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
NATURAL FAIR COVER
"OPEN BRUSH"        C         0.50     0.16     1.00     92
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.16
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 0.50     SUBAREA RUNOFF(CFS) = 1.41
EFFECTIVE AREA(ACRES) = 4.65   AREA-AVERAGED Fm(INCH/HR) = 0.12
AREA-AVERAGED Fp(INCH/HR) = 0.25   AREA-AVERAGED Ap = 0.46
TOTAL AREA(ACRES) = 4.65     PEAK FLOW RATE(CFS) = 13.29

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*****
FLOW PROCESS FROM NODE 32.00 TO NODE 32.00 IS CODE = 81
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>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

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=====
MAINLINE Tc(MIN) = 11.16
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.293
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
  LAND USE          GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
RESIDENTIAL

```

"2 DWELLINGS/ACRE" C 0.45 0.27 0.70 86
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
 SUBAREA AREA(ACRES) = 0.45 SUBAREA RUNOFF(CFS) = 1.26
 EFFECTIVE AREA(ACRES) = 5.10 AREA-AVERAGED Fm(INCH/HR) = 0.12
 AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.48
 TOTAL AREA(ACRES) = 5.10 PEAK FLOW RATE(CFS) = 14.55

 FLOW PROCESS FROM NODE 32.00 TO NODE 32.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 11.16
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.293
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 3.70 0.45 0.70 76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
 SUBAREA AREA(ACRES) = 3.70 SUBAREA RUNOFF(CFS) = 9.91
 EFFECTIVE AREA(ACRES) = 8.80 AREA-AVERAGED Fm(INCH/HR) = 0.20
 AREA-AVERAGED Fp(INCH/HR) = 0.36 AREA-AVERAGED Ap = 0.57
 TOTAL AREA(ACRES) = 8.80 PEAK FLOW RATE(CFS) = 24.46

 FLOW PROCESS FROM NODE 32.00 TO NODE 32.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 11.16
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.293
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" C 0.75 0.27 0.70 86
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
 SUBAREA AREA(ACRES) = 0.75 SUBAREA RUNOFF(CFS) = 2.09
 EFFECTIVE AREA(ACRES) = 9.55 AREA-AVERAGED Fm(INCH/HR) = 0.20
 AREA-AVERAGED Fp(INCH/HR) = 0.35 AREA-AVERAGED Ap = 0.58
 TOTAL AREA(ACRES) = 9.55 PEAK FLOW RATE(CFS) = 26.55

 FLOW PROCESS FROM NODE 32.00 TO NODE 32.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 11.16
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.293
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH" C 0.15 0.16 1.00 92
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.16
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 0.15 SUBAREA RUNOFF(CFS) = 0.42
 EFFECTIVE AREA(ACRES) = 9.70 AREA-AVERAGED Fm(INCH/HR) = 0.20
 AREA-AVERAGED Fp(INCH/HR) = 0.34 AREA-AVERAGED Ap = 0.59
 TOTAL AREA(ACRES) = 9.70 PEAK FLOW RATE(CFS) = 26.97

 FLOW PROCESS FROM NODE 32.00 TO NODE 32.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 11.16
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.293
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH" B 0.15 0.31 1.00 84
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.31
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 0.15 SUBAREA RUNOFF(CFS) = 0.40
 EFFECTIVE AREA(ACRES) = 9.85 AREA-AVERAGED Fm(INCH/HR) = 0.20
 AREA-AVERAGED Fp(INCH/HR) = 0.34 AREA-AVERAGED Ap = 0.60
 TOTAL AREA(ACRES) = 9.85 PEAK FLOW RATE(CFS) = 27.38

 FLOW PROCESS FROM NODE 32.00 TO NODE 43.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 900.83 DOWNSTREAM(FEET) = 900.70
 FLOW LENGTH(FEET) = 45.00 MANNING'S N = 0.012
 DEPTH OF FLOW IN 33.0 INCH PIPE IS 24.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 5.73
 ESTIMATED PIPE DIAMETER(INCH) = 33.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 27.38
 PIPE TRAVEL TIME(MIN.) = 0.13 Tc(MIN.) = 11.29
 LONGEST FLOWPATH FROM NODE 30.00 TO NODE 43.00 = 1086.00 FEET.

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*****
FLOW PROCESS FROM NODE      43.00 TO NODE      43.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
-----
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 11.29
RAINFALL INTENSITY(INCH/HR) = 3.27
AREA-AVERAGED Fm(INCH/HR) = 0.20
AREA-AVERAGED Fp(INCH/HR) = 0.34
AREA-AVERAGED Ap = 0.60
EFFECTIVE STREAM AREA(ACRES) = 9.85
TOTAL STREAM AREA(ACRES) = 9.85
PEAK FLOW RATE(CFS) AT CONFLUENCE = 27.38

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*****
FLOW PROCESS FROM NODE      40.00 TO NODE      41.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
-----
INITIAL SUBAREA FLOW-LENGTH(FEET) = 540.00
ELEVATION DATA: UPSTREAM(FEET) = 913.16 DOWNSTREAM(FEET) = 909.14

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.034
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.509
SUBAREA Tc AND LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS   Tc
LAND USE           GROUP   (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
COMMERCIAL         B       0.45   0.45   0.10  76  10.03
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
SUBAREA RUNOFF(CFS) = 1.40
TOTAL AREA(ACRES) = 0.45 PEAK FLOW RATE(CFS) = 1.40

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*****
FLOW PROCESS FROM NODE      40.00 TO NODE      41.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 10.03
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.509
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE           GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL         A       0.80   0.80   0.10  52
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.80
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
SUBAREA AREA(ACRES) = 0.80 SUBAREA RUNOFF(CFS) = 2.47
EFFECTIVE AREA(ACRES) = 1.25 AREA-AVERAGED Fm(INCH/HR) = 0.07
AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 1.25 PEAK FLOW RATE(CFS) = 3.87

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*****
FLOW PROCESS FROM NODE      40.00 TO NODE      41.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 10.03
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.509
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE           GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"OPEN BRUSH"      A       0.20   0.61   1.00  66
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 0.20 SUBAREA RUNOFF(CFS) = 0.52
EFFECTIVE AREA(ACRES) = 1.45 AREA-AVERAGED Fm(INCH/HR) = 0.14
AREA-AVERAGED Fp(INCH/HR) = 0.64 AREA-AVERAGED Ap = 0.22
TOTAL AREA(ACRES) = 1.45 PEAK FLOW RATE(CFS) = 4.39

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*****
FLOW PROCESS FROM NODE      41.00 TO NODE      42.00 IS CODE = 9
-----
>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<
-----
UPSTREAM NODE ELEVATION(FEET) = 909.14
DOWNSTREAM NODE ELEVATION(FEET) = 906.39
CHANNEL LENGTH THRU SUBAREA(FEET) = 551.00
"V" GUTTER WIDTH(FEET) = 3.00 GUTTER HIKE(FEET) = 0.150
PAVEMENT LIP(FEET) = 0.030 MANNING'S N = .0150
PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
MAXIMUM DEPTH(FEET) = 1.00
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.868
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE           GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL         A       6.10   0.80   0.10  52
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.80
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.82
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.29
AVERAGE FLOW DEPTH(FEET) = 0.46 FLOOD WIDTH(FEET) = 31.27
"V" GUTTER FLOW TRAVEL TIME(MIN.) = 4.01 Tc(MIN.) = 14.04
SUBAREA AREA(ACRES) = 6.10 SUBAREA RUNOFF(CFS) = 15.31
EFFECTIVE AREA(ACRES) = 7.55 AREA-AVERAGED Fm(INCH/HR) = 0.09

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AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.12
 TOTAL AREA (ACRES) = 7.55 PEAK FLOW RATE (CFS) = 18.87

END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.53 FLOOD WIDTH (FEET) = 37.99
 FLOW VELOCITY (FEET/SEC.) = 2.52 DEPTH*VELOCITY (FT*FT/SEC) = 1.34
 LONGEST FLOWPATH FROM NODE 40.00 TO NODE 42.00 = 1091.00 FEET.

 FLOW PROCESS FROM NODE 41.00 TO NODE 42.00 IS CODE = 81

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

MAINLINE Tc (MIN) = 14.04
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.868
 SUBAREA LOSS RATE DATA (AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL B 5.55 0.45 0.10 76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.45
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA (ACRES) = 5.55 SUBAREA RUNOFF (CFS) = 14.10
 EFFECTIVE AREA (ACRES) = 13.10 AREA-AVERAGED Fm (INCH/HR) = 0.07
 AREA-AVERAGED Fp (INCH/HR) = 0.63 AREA-AVERAGED Ap = 0.11
 TOTAL AREA (ACRES) = 13.10 PEAK FLOW RATE (CFS) = 32.97

 FLOW PROCESS FROM NODE 41.00 TO NODE 42.00 IS CODE = 81

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

MAINLINE Tc (MIN) = 14.04
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.868
 SUBAREA LOSS RATE DATA (AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH" A 0.40 0.61 1.00 66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA (ACRES) = 0.40 SUBAREA RUNOFF (CFS) = 0.81
 EFFECTIVE AREA (ACRES) = 13.50 AREA-AVERAGED Fm (INCH/HR) = 0.09
 AREA-AVERAGED Fp (INCH/HR) = 0.63 AREA-AVERAGED Ap = 0.14
 TOTAL AREA (ACRES) = 13.50 PEAK FLOW RATE (CFS) = 33.78

 FLOW PROCESS FROM NODE 42.00 TO NODE 43.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM (FEET) = 901.40 DOWNSTREAM (FEET) = 900.60
 FLOW LENGTH (FEET) = 110.00 MANNING'S N = 0.012
 DEPTH OF FLOW IN 30.0 INCH PIPE IS 22.6 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 8.53
 ESTIMATED PIPE DIAMETER (INCH) = 30.00 NUMBER OF PIPES = 1
 PIPE-FLOW (CFS) = 33.78
 PIPE TRAVEL TIME (MIN.) = 0.21 Tc (MIN.) = 14.26
 LONGEST FLOWPATH FROM NODE 40.00 TO NODE 43.00 = 1201.00 FEET.

 FLOW PROCESS FROM NODE 43.00 TO NODE 43.00 IS CODE = 1

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

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 14.26
 RAINFALL INTENSITY (INCH/HR) = 2.84
 AREA-AVERAGED Fm (INCH/HR) = 0.09
 AREA-AVERAGED Fp (INCH/HR) = 0.63
 AREA-AVERAGED Ap = 0.14
 EFFECTIVE STREAM AREA (ACRES) = 13.50
 TOTAL STREAM AREA (ACRES) = 13.50
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 33.78

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	27.38	11.29	3.270	0.34 (0.20)	0.60	9.8	30.00
2	33.78	14.26	2.842	0.63 (0.09)	0.14	13.5	40.00

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	58.27	11.29	3.270	0.40 (0.14)	0.36	20.5	30.00
2	57.34	14.26	2.842	0.41 (0.14)	0.33	23.3	40.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 58.27 Tc (MIN.) = 11.29
 EFFECTIVE AREA (ACRES) = 20.54 AREA-AVERAGED Fm (INCH/HR) = 0.14
 AREA-AVERAGED Fp (INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.36
 TOTAL AREA (ACRES) = 23.35
 LONGEST FLOWPATH FROM NODE 40.00 TO NODE 43.00 = 1201.00 FEET.

```

*****
FLOW PROCESS FROM NODE      43.00 TO NODE      44.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM( FEET) = 900.60 DOWNSTREAM( FEET) = 900.15
FLOW LENGTH( FEET) = 91.00 MANNING'S N = 0.012
DEPTH OF FLOW IN 39.0 INCH PIPE IS 30.4 INCHES
PIPE-FLOW VELOCITY( FEET/SEC.) = 8.41
ESTIMATED PIPE DIAMETER( INCH) = 39.00 NUMBER OF PIPES = 1
PIPE-FLOW( CFS) = 58.27
PIPE TRAVEL TIME( MIN.) = 0.18 Tc( MIN.) = 11.47
LONGEST FLOWPATH FROM NODE      40.00 TO NODE      44.00 = 1292.00 FEET.
*****
FLOW PROCESS FROM NODE      44.00 TO NODE      44.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc( MIN) = 11.47
* 100 YEAR RAINFALL INTENSITY( INCH/HR) = 3.239
SUBAREA LOSS RATE DATA( AMC III):
DEVELOPMENT TYPE/      SCS SOIL      AREA      Fp      Ap      SCS
LAND USE              GROUP      (ACRES)    (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"OPEN BRUSH"          B          0.45      0.31      1.00      84
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp( INCH/HR) = 0.31
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA( ACRES) = 0.45 SUBAREA RUNOFF( CFS) = 1.19
EFFECTIVE AREA( ACRES) = 20.99 AREA-AVERAGED Fm( INCH/HR) = 0.15
AREA-AVERAGED Fp( INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.37
TOTAL AREA( ACRES) = 23.80 PEAK FLOW RATE( CFS) = 58.39
*****
FLOW PROCESS FROM NODE      44.00 TO NODE      44.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc( MIN) = 11.47
* 100 YEAR RAINFALL INTENSITY( INCH/HR) = 3.239
SUBAREA LOSS RATE DATA( AMC III):
DEVELOPMENT TYPE/      SCS SOIL      AREA      Fp      Ap      SCS
LAND USE              GROUP      (ACRES)    (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"2 DWELLINGS/ACRE"   C          0.10      0.27      0.70      86
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp( INCH/HR) = 0.27
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
SUBAREA AREA( ACRES) = 0.10 SUBAREA RUNOFF( CFS) = 0.27
EFFECTIVE AREA( ACRES) = 21.09 AREA-AVERAGED Fm( INCH/HR) = 0.15
AREA-AVERAGED Fp( INCH/HR) = 0.39 AREA-AVERAGED Ap = 0.37
TOTAL AREA( ACRES) = 23.90 PEAK FLOW RATE( CFS) = 58.67
*****
FLOW PROCESS FROM NODE      44.00 TO NODE      44.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc( MIN) = 11.47
* 100 YEAR RAINFALL INTENSITY( INCH/HR) = 3.239
SUBAREA LOSS RATE DATA( AMC III):
DEVELOPMENT TYPE/      SCS SOIL      AREA      Fp      Ap      SCS
LAND USE              GROUP      (ACRES)    (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"2 DWELLINGS/ACRE"   C          0.50      0.27      0.70      86
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp( INCH/HR) = 0.27
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
SUBAREA AREA( ACRES) = 0.50 SUBAREA RUNOFF( CFS) = 1.37
EFFECTIVE AREA( ACRES) = 21.59 AREA-AVERAGED Fm( INCH/HR) = 0.15
AREA-AVERAGED Fp( INCH/HR) = 0.39 AREA-AVERAGED Ap = 0.38
TOTAL AREA( ACRES) = 24.40 PEAK FLOW RATE( CFS) = 60.04
*****
FLOW PROCESS FROM NODE      44.00 TO NODE      44.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc( MIN) = 11.47
* 100 YEAR RAINFALL INTENSITY( INCH/HR) = 3.239
SUBAREA LOSS RATE DATA( AMC III):
DEVELOPMENT TYPE/      SCS SOIL      AREA      Fp      Ap      SCS
LAND USE              GROUP      (ACRES)    (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"2 DWELLINGS/ACRE"   B          0.35      0.45      0.70      76
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp( INCH/HR) = 0.45
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
SUBAREA AREA( ACRES) = 0.35 SUBAREA RUNOFF( CFS) = 0.92
EFFECTIVE AREA( ACRES) = 21.94 AREA-AVERAGED Fm( INCH/HR) = 0.15
AREA-AVERAGED Fp( INCH/HR) = 0.39 AREA-AVERAGED Ap = 0.39
TOTAL AREA( ACRES) = 24.75 PEAK FLOW RATE( CFS) = 60.96
*****
FLOW PROCESS FROM NODE      44.00 TO NODE      45.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM( FEET) = 900.15 DOWNSTREAM( FEET) = 899.55
FLOW LENGTH( FEET) = 100.00 MANNING'S N = 0.012

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DEPTH OF FLOW IN 39.0 INCH PIPE IS 29.0 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 9.22
 ESTIMATED PIPE DIAMETER (INCH) = 39.00 NUMBER OF PIPES = 1
 PIPE-FLOW (CFS) = 60.96
 PIPE TRAVEL TIME (MIN.) = 0.18 Tc (MIN.) = 11.65
 LONGEST FLOWPATH FROM NODE 40.00 TO NODE 45.00 = 1392.00 FEET.

 FLOW PROCESS FROM NODE 45.00 TO NODE 45.00 IS CODE = 81

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

MAINLINE Tc (MIN) = 11.65
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.209
 SUBAREA LOSS RATE DATA (AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH" B 0.50 0.31 1.00 84
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.31
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA (ACRES) = 0.50 SUBAREA RUNOFF (CFS) = 1.31
 EFFECTIVE AREA (ACRES) = 22.44 AREA-AVERAGED Fm (INCH/HR) = 0.15
 AREA-AVERAGED Fp (INCH/HR) = 0.39 AREA-AVERAGED Ap = 0.40
 TOTAL AREA (ACRES) = 25.25 PEAK FLOW RATE (CFS) = 61.67

 FLOW PROCESS FROM NODE 45.00 TO NODE 45.00 IS CODE = 81

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

MAINLINE Tc (MIN) = 11.65
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.209
 SUBAREA LOSS RATE DATA (AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" C 2.55 0.27 0.70 86
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.27
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
 SUBAREA AREA (ACRES) = 2.55 SUBAREA RUNOFF (CFS) = 6.93
 EFFECTIVE AREA (ACRES) = 24.99 AREA-AVERAGED Fm (INCH/HR) = 0.16
 AREA-AVERAGED Fp (INCH/HR) = 0.37 AREA-AVERAGED Ap = 0.43
 TOTAL AREA (ACRES) = 27.80 PEAK FLOW RATE (CFS) = 68.60

 FLOW PROCESS FROM NODE 45.00 TO NODE 45.00 IS CODE = 81

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

MAINLINE Tc (MIN) = 11.65
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.209
 SUBAREA LOSS RATE DATA (AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 1.45 0.45 0.70 76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.45
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
 SUBAREA AREA (ACRES) = 1.45 SUBAREA RUNOFF (CFS) = 3.77
 EFFECTIVE AREA (ACRES) = 26.44 AREA-AVERAGED Fm (INCH/HR) = 0.17
 AREA-AVERAGED Fp (INCH/HR) = 0.37 AREA-AVERAGED Ap = 0.45
 TOTAL AREA (ACRES) = 29.25 PEAK FLOW RATE (CFS) = 72.37

 FLOW PROCESS FROM NODE 45.00 TO NODE 46.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM (FEET) = 899.55 DOWNSTREAM (FEET) = 898.40
 FLOW LENGTH (FEET) = 208.00 MANNING'S N = 0.012
 DEPTH OF FLOW IN 42.0 INCH PIPE IS 31.6 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 9.31
 ESTIMATED PIPE DIAMETER (INCH) = 42.00 NUMBER OF PIPES = 1
 PIPE-FLOW (CFS) = 72.37
 PIPE TRAVEL TIME (MIN.) = 0.37 Tc (MIN.) = 12.02
 LONGEST FLOWPATH FROM NODE 40.00 TO NODE 46.00 = 1600.00 FEET.

 FLOW PROCESS FROM NODE 46.00 TO NODE 46.00 IS CODE = 81

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

MAINLINE Tc (MIN) = 12.02
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.149
 SUBAREA LOSS RATE DATA (AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH" B 0.55 0.31 1.00 84
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.31
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA (ACRES) = 0.55 SUBAREA RUNOFF (CFS) = 1.41
 EFFECTIVE AREA (ACRES) = 26.99 AREA-AVERAGED Fm (INCH/HR) = 0.17
 AREA-AVERAGED Fp (INCH/HR) = 0.37 AREA-AVERAGED Ap = 0.46
 TOTAL AREA (ACRES) = 29.80 PEAK FLOW RATE (CFS) = 72.37
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 46.00 TO NODE 47.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 898.40 DOWNSTREAM(FEET) = 896.95
 FLOW LENGTH(FEET) = 290.00 MANNING'S N = 0.012
 DEPTH OF FLOW IN 42.0 INCH PIPE IS 33.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 8.89
 ESTIMATED PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 72.37
 PIPE TRAVEL TIME(MIN.) = 0.54 Tc(MIN.) = 12.56
 LONGEST FLOWPATH FROM NODE 40.00 TO NODE 47.00 = 1890.00 FEET.

 FLOW PROCESS FROM NODE 47.00 TO NODE 47.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN) = 12.56
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.066
 SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "OPEN BRUSH"	B	0.65	0.31	1.00	84

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.31
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 0.65 SUBAREA RUNOFF(CFS) = 1.61
 EFFECTIVE AREA(ACRES) = 27.64 AREA-AVERAGED Fm(INCH/HR) = 0.17
 AREA-AVERAGED Fp(INCH/HR) = 0.37 AREA-AVERAGED Ap = 0.47
 TOTAL AREA(ACRES) = 30.45 PEAK FLOW RATE(CFS) = 72.37
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 47.00 TO NODE 72.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 896.95 DOWNSTREAM(FEET) = 896.00
 FLOW LENGTH(FEET) = 134.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 42.0 INCH PIPE IS 30.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 9.68
 ESTIMATED PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 72.37
 PIPE TRAVEL TIME(MIN.) = 0.23 Tc(MIN.) = 12.79
 LONGEST FLOWPATH FROM NODE 40.00 TO NODE 72.00 = 2024.00 FEET.

=====

END OF STUDY SUMMARY:
 TOTAL AREA(ACRES) = 30.45 TC(MIN.) = 12.79
 EFFECTIVE AREA(ACRES) = 27.64 AREA-AVERAGED Fm(INCH/HR) = 0.17
 AREA-AVERAGED Fp(INCH/HR) = 0.37 AREA-AVERAGED Ap = 0.47
 PEAK FLOW RATE(CFS) = 72.37

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap (INCH/HR)	Ae (ACRES)	HEADWATER NODE
1	72.37	12.79	3.033	0.37(0.17)	0.47	27.6	30.00
2	69.61	15.77	2.675	0.38(0.17)	0.44	30.4	40.00

=====

END OF RATIONAL METHOD ANALYSIS

Analysis prepared by:

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***** DESCRIPTION OF STUDY *****
* LA CADENA DR COLTON, SAN BERNARDINO COUNTY *
* 100-YEAR PROPOSED CONDITION *
* PUBLIC SD NODES 50-75 *

FILE NAME: C:\XDRIVE\3535\100PUB.DAT
TIME/DATE OF STUDY: 14:15 04/12/2017

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

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

USER SPECIFIED STORM EVENT (YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE (INCH) = 12.00
SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL

SLOPE OF INTENSITY DURATION CURVE (LOG(I; IN/HR) vs. LOG(Tc; MIN)) = 0.6000
USER SPECIFIED 1-HOUR INTENSITY (INCH/HOUR) = 1.2000

ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD

FLOW PROCESS FROM NODE 50.00 TO NODE 51.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH (FEET) = 750.00
ELEVATION DATA: UPSTREAM (FEET) = 1400.00 DOWNSTREAM (FEET) = 1240.00

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$
SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 10.101
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.495
SUBAREA T_c AND LOSS RATE DATA (AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN	T_c (MIN.)
NATURAL POOR COVER "WOODLAND"	C	3.90	0.16	1.00	92	10.10

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.16
SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 1.00
SUBAREA RUNOFF (CFS) = 11.71
TOTAL AREA (ACRES) = 3.90 PEAK FLOW RATE (CFS) = 11.71

FLOW PROCESS FROM NODE 51.00 TO NODE 52.00 IS CODE = 51

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

=====

ELEVATION DATA: UPSTREAM (FEET) = 1240.00 DOWNSTREAM (FEET) = 1050.00
CHANNEL LENGTH THRU SUBAREA (FEET) = 650.00 CHANNEL SLOPE = 0.2923
CHANNEL BASE (FEET) = 50.00 "Z" FACTOR = 6.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 2.00
CHANNEL FLOW THRU SUBAREA (CFS) = 11.71
FLOW VELOCITY (FEET/SEC) = 4.00 FLOW DEPTH (FEET) = 0.06
TRAVEL TIME (MIN.) = 2.71 T_c (MIN.) = 12.81
LONGEST FLOWPATH FROM NODE 50.00 TO NODE 52.00 = 1400.00 FEET.

FLOW PROCESS FROM NODE 51.00 TO NODE 52.00 IS CODE = 81

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

=====

MAINLINE T_c (MIN) = 12.81
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.030
SUBAREA LOSS RATE DATA (AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN
NATURAL POOR COVER "OPEN BRUSH"	C	10.50	0.07	1.00	96

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.07
SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 1.00
SUBAREA AREA (ACRES) = 10.50 SUBAREA RUNOFF (CFS) = 28.01
EFFECTIVE AREA (ACRES) = 14.40 AREA-AVERAGED F_m (INCH/HR) = 0.09
AREA-AVERAGED F_p (INCH/HR) = 0.09 AREA-AVERAGED A_p = 1.00
TOTAL AREA (ACRES) = 14.40 PEAK FLOW RATE (CFS) = 38.08

FLOW PROCESS FROM NODE 51.00 TO NODE 52.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN) = 12.81
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.030
 SUBAREA LOSS RATE DATA (AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL POOR COVER
 "OPEN BRUSH" B 0.95 0.16 1.00 92
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.16
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA (ACRES) = 0.95 SUBAREA RUNOFF (CFS) = 2.45
 EFFECTIVE AREA (ACRES) = 15.35 AREA-AVERAGED Fm (INCH/HR) = 0.10
 AREA-AVERAGED Fp (INCH/HR) = 0.10 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 15.35 PEAK FLOW RATE (CFS) = 40.54

 FLOW PROCESS FROM NODE 52.00 TO NODE 53.00 IS CODE = 51

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<<
 =====
 ELEVATION DATA: UPSTREAM (FEET) = 1050.00 DOWNSTREAM (FEET) = 1007.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 847.00 CHANNEL SLOPE = 0.0508
 CHANNEL BASE (FEET) = 50.00 "Z" FACTOR = 6.000
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) = 40.54
 FLOW VELOCITY (FEET/SEC) = 3.79 FLOW DEPTH (FEET) = 0.21
 TRAVEL TIME (MIN.) = 3.73 Tc (MIN.) = 16.54
 LONGEST FLOWPATH FROM NODE 50.00 TO NODE 53.00 = 2247.00 FEET.

 FLOW PROCESS FROM NODE 52.00 TO NODE 53.00 IS CODE = 81

>>>> ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
 =====
 MAINLINE Tc (MIN) = 16.54
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.600
 SUBAREA LOSS RATE DATA (AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL POOR COVER
 "OPEN BRUSH" B 5.75 0.16 1.00 92
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.16
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA (ACRES) = 5.75 SUBAREA RUNOFF (CFS) = 12.63
 EFFECTIVE AREA (ACRES) = 21.10 AREA-AVERAGED Fm (INCH/HR) = 0.11
 AREA-AVERAGED Fp (INCH/HR) = 0.11 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 21.10 PEAK FLOW RATE (CFS) = 47.22

 FLOW PROCESS FROM NODE 52.00 TO NODE 53.00 IS CODE = 81

>>>> ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
 =====
 MAINLINE Tc (MIN) = 16.54
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.600
 SUBAREA LOSS RATE DATA (AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL POOR COVER
 "OPEN BRUSH" C 6.70 0.07 1.00 96
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.07
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA (ACRES) = 6.70 SUBAREA RUNOFF (CFS) = 15.28
 EFFECTIVE AREA (ACRES) = 27.80 AREA-AVERAGED Fm (INCH/HR) = 0.10
 AREA-AVERAGED Fp (INCH/HR) = 0.10 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 27.80 PEAK FLOW RATE (CFS) = 62.49

 FLOW PROCESS FROM NODE 53.00 TO NODE 54.00 IS CODE = 51

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<<
 =====
 ELEVATION DATA: UPSTREAM (FEET) = 1007.00 DOWNSTREAM (FEET) = 1005.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 376.00 CHANNEL SLOPE = 0.0053
 CHANNEL BASE (FEET) = 50.00 "Z" FACTOR = 6.000
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA (CFS) = 62.49
 FLOW VELOCITY (FEET/SEC) = 2.25 FLOW DEPTH (FEET) = 0.52
 TRAVEL TIME (MIN.) = 2.78 Tc (MIN.) = 19.32
 LONGEST FLOWPATH FROM NODE 50.00 TO NODE 54.00 = 2623.00 FEET.

 FLOW PROCESS FROM NODE 53.00 TO NODE 54.00 IS CODE = 81

>>>> ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
 =====
 MAINLINE Tc (MIN) = 19.32
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.369
 SUBAREA LOSS RATE DATA (AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL POOR COVER
 "OPEN BRUSH" B 9.40 0.16 1.00 92
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.16
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA (ACRES) = 9.40 SUBAREA RUNOFF (CFS) = 18.68
 EFFECTIVE AREA (ACRES) = 37.20 AREA-AVERAGED Fm (INCH/HR) = 0.12
 AREA-AVERAGED Fp (INCH/HR) = 0.12 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 37.20 PEAK FLOW RATE(CFS) = 75.39

 FLOW PROCESS FROM NODE 53.00 TO NODE 54.00 IS CODE = 81

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

 MAINLINE Tc(MIN) = 19.32
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.369
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL POOR COVER
 "OPEN BRUSH" C 3.00 0.07 1.00 96
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.07
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 3.00 SUBAREA RUNOFF(CFS) = 6.22
 EFFECTIVE AREA(ACRES) = 40.20 AREA-AVERAGED Fm(INCH/HR) = 0.11
 AREA-AVERAGED Fp(INCH/HR) = 0.11 AREA-AVERAGED Ap = 1.00
 TOTAL AREA(ACRES) = 40.20 PEAK FLOW RATE(CFS) = 81.60

 FLOW PROCESS FROM NODE 54.00 TO NODE 54.00 IS CODE = 81

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

 MAINLINE Tc(MIN) = 19.32
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.369
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
 "2 DWELLINGS/ACRE" B 1.45 0.45 0.10 76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA(ACRES) = 1.45 SUBAREA RUNOFF(CFS) = 3.03
 EFFECTIVE AREA(ACRES) = 41.65 AREA-AVERAGED Fm(INCH/HR) = 0.11
 AREA-AVERAGED Fp(INCH/HR) = 0.11 AREA-AVERAGED Ap = 0.97
 TOTAL AREA(ACRES) = 41.65 PEAK FLOW RATE(CFS) = 84.63

 FLOW PROCESS FROM NODE 54.00 TO NODE 54.00 IS CODE = 81

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

 MAINLINE Tc(MIN) = 19.32
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.369
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 16.10 0.45 0.70 76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
 SUBAREA AREA(ACRES) = 16.10 SUBAREA RUNOFF(CFS) = 29.74
 EFFECTIVE AREA(ACRES) = 57.75 AREA-AVERAGED Fm(INCH/HR) = 0.17
 AREA-AVERAGED Fp(INCH/HR) = 0.19 AREA-AVERAGED Ap = 0.89
 TOTAL AREA(ACRES) = 57.75 PEAK FLOW RATE(CFS) = 114.37

 FLOW PROCESS FROM NODE 54.00 TO NODE 54.00 IS CODE = 81

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

 MAINLINE Tc(MIN) = 19.32
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.369
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL POOR COVER
 "OPEN BRUSH" B 2.65 0.16 1.00 92
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.16
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 2.65 SUBAREA RUNOFF(CFS) = 5.27
 EFFECTIVE AREA(ACRES) = 60.40 AREA-AVERAGED Fm(INCH/HR) = 0.17
 AREA-AVERAGED Fp(INCH/HR) = 0.19 AREA-AVERAGED Ap = 0.90
 TOTAL AREA(ACRES) = 60.40 PEAK FLOW RATE(CFS) = 119.64

 FLOW PROCESS FROM NODE 54.00 TO NODE 54.00 IS CODE = 81

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

 MAINLINE Tc(MIN) = 19.32
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.369
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL POOR COVER
 "OPEN BRUSH" C 8.10 0.07 1.00 96
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.07
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 8.10 SUBAREA RUNOFF(CFS) = 16.78
 EFFECTIVE AREA(ACRES) = 68.50 AREA-AVERAGED Fm(INCH/HR) = 0.16
 AREA-AVERAGED Fp(INCH/HR) = 0.17 AREA-AVERAGED Ap = 0.91
 TOTAL AREA(ACRES) = 68.50 PEAK FLOW RATE(CFS) = 136.42

 FLOW PROCESS FROM NODE 54.00 TO NODE 55.00 IS CODE = 61

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

=====

UPSTREAM ELEVATION(FEET) = 1005.00 DOWNSTREAM ELEVATION(FEET) = 1002.00
STREET LENGTH(FEET) = 456.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 25.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0149
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 136.67
STREET FLOWING FULL
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.92
HALFSTREET FLOOD WIDTH(FEET) = 37.55
AVERAGE FLOW VELOCITY(FEET/SEC.) = 4.71
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.32
STREET FLOW TRAVEL TIME(MIN.) = 1.61 Tc(MIN.) = 20.93
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.257
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL B 0.25 0.45 0.10 76
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
SUBAREA AREA(ACRES) = 0.25 SUBAREA RUNOFF(CFS) = 0.50
EFFECTIVE AREA(ACRES) = 68.75 AREA-AVERAGED Fm(INCH/HR) = 0.16
AREA-AVERAGED Fp(INCH/HR) = 0.17 AREA-AVERAGED Ap = 0.91
TOTAL AREA(ACRES) = 68.75 PEAK FLOW RATE(CFS) = 136.42
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.92 HALFSTREET FLOOD WIDTH(FEET) = 37.49
FLOW VELOCITY(FEET/SEC.) = 4.72 DEPTH*VELOCITY(FT*FT/SEC.) = 4.32
LONGEST FLOWPATH FROM NODE 50.00 TO NODE 55.00 = 3079.00 FEET.

FLOW PROCESS FROM NODE 54.00 TO NODE 55.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN) = 20.93
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.257
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"2 DWELLINGS/ACRE" B 7.65 0.45 0.70 76
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
SUBAREA AREA(ACRES) = 7.65 SUBAREA RUNOFF(CFS) = 13.36
EFFECTIVE AREA(ACRES) = 76.40 AREA-AVERAGED Fm(INCH/HR) = 0.17
AREA-AVERAGED Fp(INCH/HR) = 0.19 AREA-AVERAGED Ap = 0.89
TOTAL AREA(ACRES) = 76.40 PEAK FLOW RATE(CFS) = 143.42

FLOW PROCESS FROM NODE 55.00 TO NODE 56.00 IS CODE = 61

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

=====

UPSTREAM ELEVATION(FEET) = 1002.00 DOWNSTREAM ELEVATION(FEET) = 925.00
STREET LENGTH(FEET) = 820.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 25.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0149
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 144.58
STREET FLOW SPLITS OVER STREET-CROWN
FULL DEPTH(FEET) = 0.66 FLOOD WIDTH(FEET) = 25.00
FULL HALF-STREET VELOCITY(FEET/SEC.) = 12.15
SPLIT DEPTH(FEET) = 0.63 SPLIT FLOOD WIDTH(FEET) = 23.48
SPLIT FLOW(CFS) = 66.37 SPLIT VELOCITY(FEET/SEC.) = 11.64
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.66
HALFSTREET FLOOD WIDTH(FEET) = 25.00
AVERAGE FLOW VELOCITY(FEET/SEC.) = 12.15
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.99
STREET FLOW TRAVEL TIME(MIN.) = 1.13 Tc(MIN.) = 22.06
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.187
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL B 1.20 0.45 0.10 76
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10

SUBAREA AREA(ACRES) = 1.20 SUBAREA RUNOFF(CFS) = 2.31
 EFFECTIVE AREA(ACRES) = 77.60 AREA-AVERAGED Fm(INCH/HR) = 0.17
 AREA-AVERAGED Fp(INCH/HR) = 0.19 AREA-AVERAGED Ap = 0.87
 TOTAL AREA(ACRES) = 77.60 PEAK FLOW RATE(CFS) = 143.42
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 25.00
 FLOW VELOCITY(FEET/SEC.) = 12.15 DEPTH*VELOCITY(FT*FT/SEC.) = 7.99
 LONGEST FLOWPATH FROM NODE 50.00 TO NODE 56.00 = 3899.00 FEET.

 FLOW PROCESS FROM NODE 55.00 TO NODE 56.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 22.06
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.187
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL B 2.00 0.45 0.10 76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA(ACRES) = 2.00 SUBAREA RUNOFF(CFS) = 3.86
 EFFECTIVE AREA(ACRES) = 79.60 AREA-AVERAGED Fm(INCH/HR) = 0.17
 AREA-AVERAGED Fp(INCH/HR) = 0.19 AREA-AVERAGED Ap = 0.86
 TOTAL AREA(ACRES) = 79.60 PEAK FLOW RATE(CFS) = 144.79

 FLOW PROCESS FROM NODE 55.00 TO NODE 56.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 22.06
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.187
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 8.25 0.45 0.70 76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
 SUBAREA AREA(ACRES) = 8.25 SUBAREA RUNOFF(CFS) = 13.89
 EFFECTIVE AREA(ACRES) = 87.85 AREA-AVERAGED Fm(INCH/HR) = 0.18
 AREA-AVERAGED Fp(INCH/HR) = 0.21 AREA-AVERAGED Ap = 0.84
 TOTAL AREA(ACRES) = 87.85 PEAK FLOW RATE(CFS) = 158.68

 FLOW PROCESS FROM NODE 55.00 TO NODE 56.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 22.06
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.187
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 3.90 0.45 0.70 76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
 SUBAREA AREA(ACRES) = 3.90 SUBAREA RUNOFF(CFS) = 6.57
 EFFECTIVE AREA(ACRES) = 91.75 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp(INCH/HR) = 0.22 AREA-AVERAGED Ap = 0.83
 TOTAL AREA(ACRES) = 91.75 PEAK FLOW RATE(CFS) = 165.25

 FLOW PROCESS FROM NODE 55.00 TO NODE 56.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 22.06
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.187
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 8.20 0.45 0.70 76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
 SUBAREA AREA(ACRES) = 8.20 SUBAREA RUNOFF(CFS) = 13.81
 EFFECTIVE AREA(ACRES) = 99.95 AREA-AVERAGED Fm(INCH/HR) = 0.20
 AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.82
 TOTAL AREA(ACRES) = 99.95 PEAK FLOW RATE(CFS) = 179.06

 FLOW PROCESS FROM NODE 55.00 TO NODE 56.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 22.06
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.187
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" C 1.15 0.27 0.70 86
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
SUBAREA AREA (ACRES) = 1.15 SUBAREA RUNOFF (CFS) = 2.07
EFFECTIVE AREA (ACRES) = 101.10 AREA-AVERAGED Fm (INCH/HR) = 0.20
AREA-AVERAGED Fp (INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.82
TOTAL AREA (ACRES) = 101.10 PEAK FLOW RATE (CFS) = 181.13

FLOW PROCESS FROM NODE 55.00 TO NODE 56.00 IS CODE = 81

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

MAINLINE Tc (MIN) = 22.06
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.187
SUBAREA LOSS RATE DATA (AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL C 0.15 0.27 0.10 86
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.27
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
SUBAREA AREA (ACRES) = 0.15 SUBAREA RUNOFF (CFS) = 0.29
EFFECTIVE AREA (ACRES) = 101.25 AREA-AVERAGED Fm (INCH/HR) = 0.20
AREA-AVERAGED Fp (INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.82
TOTAL AREA (ACRES) = 101.25 PEAK FLOW RATE (CFS) = 181.42

FLOW PROCESS FROM NODE 56.00 TO NODE 57.00 IS CODE = 61

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

UPSTREAM ELEVATION (FEET) = 925.00 DOWNSTREAM ELEVATION (FEET) = 914.45
STREET LENGTH (FEET) = 777.00 CURB HEIGHT (INCHES) = 8.0
STREET HALFWIDTH (FEET) = 40.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 35.00
INSIDE STREET CROSSFALL (DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section (curb-to-curb) = 0.0149
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 182.56
STREET FLOW SPLITS OVER STREET-CROWN
FULL DEPTH (FEET) = 0.96 FLOOD WIDTH (FEET) = 54.58
FULL HALF-STREET VELOCITY (FEET/SEC.) = 5.83
SPLIT DEPTH (FEET) = 0.87 SPLIT FLOOD WIDTH (FEET) = 45.49
SPLIT FLOW (CFS) = 75.73 SPLIT VELOCITY (FEET/SEC.) = 5.50
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH (FEET) = 0.96
HALFSTREET FLOOD WIDTH (FEET) = 54.58
AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.83
PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 5.59
STREET FLOW TRAVEL TIME (MIN.) = 2.22 Tc (MIN.) = 24.28
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.065
SUBAREA LOSS RATE DATA (AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL C 1.25 0.27 0.10 86
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.27
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
SUBAREA AREA (ACRES) = 1.25 SUBAREA RUNOFF (CFS) = 2.29
EFFECTIVE AREA (ACRES) = 102.50 AREA-AVERAGED Fm (INCH/HR) = 0.19
AREA-AVERAGED Fp (INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.81
TOTAL AREA (ACRES) = 102.50 PEAK FLOW RATE (CFS) = 181.42
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH (FEET) = 0.96 HALFSTREET FLOOD WIDTH (FEET) = 54.58
FLOW VELOCITY (FEET/SEC.) = 5.83 DEPTH*VELOCITY (FT*FT/SEC.) = 5.59
LONGEST FLOWPATH FROM NODE 50.00 TO NODE 57.00 = 4676.00 FEET.

FLOW PROCESS FROM NODE 56.00 TO NODE 57.00 IS CODE = 81

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

MAINLINE Tc (MIN) = 24.28
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.065
SUBAREA LOSS RATE DATA (AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL B 0.20 0.45 0.10 76
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.45
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
SUBAREA AREA (ACRES) = 0.20 SUBAREA RUNOFF (CFS) = 0.36
EFFECTIVE AREA (ACRES) = 102.70 AREA-AVERAGED Fm (INCH/HR) = 0.19
AREA-AVERAGED Fp (INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.81
TOTAL AREA (ACRES) = 102.70 PEAK FLOW RATE (CFS) = 181.42
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

FLOW PROCESS FROM NODE 56.00 TO NODE 57.00 IS CODE = 81

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

MAINLINE Tc (MIN) = 24.28
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.065

SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL "2 DWELLINGS/ACRE"	C	2.80	0.27	0.70	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
SUBAREA AREA(ACRES) = 2.80 SUBAREA RUNOFF(CFS) = 4.72
EFFECTIVE AREA(ACRES) = 105.50 AREA-AVERAGED Fm(INCH/HR) = 0.19
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.81
TOTAL AREA(ACRES) = 105.50 PEAK FLOW RATE(CFS) = 181.42
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

FLOW PROCESS FROM NODE 56.00 TO NODE 57.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 24.28
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.065
SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL POOR COVER "OPEN BRUSH"	B	0.15	0.16	1.00	92

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.16
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 0.15 SUBAREA RUNOFF(CFS) = 0.26
EFFECTIVE AREA(ACRES) = 105.65 AREA-AVERAGED Fm(INCH/HR) = 0.19
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.81
TOTAL AREA(ACRES) = 105.65 PEAK FLOW RATE(CFS) = 181.42
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

FLOW PROCESS FROM NODE 56.00 TO NODE 57.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 24.28
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.065
SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "OPEN BRUSH"	C	0.05	0.16	1.00	92

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.16
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 0.05 SUBAREA RUNOFF(CFS) = 0.09
EFFECTIVE AREA(ACRES) = 105.70 AREA-AVERAGED Fm(INCH/HR) = 0.19
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.81
TOTAL AREA(ACRES) = 105.70 PEAK FLOW RATE(CFS) = 181.42
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

FLOW PROCESS FROM NODE 57.00 TO NODE 58.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 906.40 DOWNSTREAM(FEET) = 906.17
FLOW LENGTH(FEET) = 46.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 63.0 INCH PIPE IS 46.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 10.67
ESTIMATED PIPE DIAMETER(INCH) = 63.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 181.42
PIPE TRAVEL TIME(MIN.) = 0.07 Tc(MIN.) = 24.35
LONGEST FLOWPATH FROM NODE 50.00 TO NODE 58.00 = 4722.00 FEET,

FLOW PROCESS FROM NODE 58.00 TO NODE 58.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 24.35
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.062
SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL "2 DWELLINGS/ACRE"	C	0.65	0.27	0.70	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
SUBAREA AREA(ACRES) = 0.65 SUBAREA RUNOFF(CFS) = 1.09
EFFECTIVE AREA(ACRES) = 106.35 AREA-AVERAGED Fm(INCH/HR) = 0.19
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.81
TOTAL AREA(ACRES) = 106.35 PEAK FLOW RATE(CFS) = 181.42
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

FLOW PROCESS FROM NODE 58.00 TO NODE 58.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 24.35
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.062
SUBAREA LOSS RATE DATA(AMC III):

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

"OPEN BRUSH" C 0.75 0.16 1.00 92
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.16
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 0.75 SUBAREA RUNOFF(CFS) = 1.28
 EFFECTIVE AREA(ACRES) = 107.10 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.81
 TOTAL AREA(ACRES) = 107.10 PEAK FLOW RATE(CFS) = 181.42
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 58.00 TO NODE 59.00 IS CODE = 31

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

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ELEVATION DATA: UPSTREAM(FEET) = 906.17 DOWNSTREAM(FEET) = 903.68
 FLOW LENGTH(FEET) = 497.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 63.0 INCH PIPE IS 46.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 10.68
 ESTIMATED PIPE DIAMETER(INCH) = 63.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 181.42
 PIPE TRAVEL TIME(MIN.) = 0.78 Tc(MIN.) = 25.12
 LONGEST FLOWPATH FROM NODE 50.00 TO NODE 59.00 = 5219.00 FEET

 FLOW PROCESS FROM NODE 59.00 TO NODE 59.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN) = 25.12
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.023
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL B 0.25 0.45 0.10 76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA(ACRES) = 0.25 SUBAREA RUNOFF(CFS) = 0.45
 EFFECTIVE AREA(ACRES) = 107.35 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.81
 TOTAL AREA(ACRES) = 107.35 PEAK FLOW RATE(CFS) = 181.42
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 59.00 TO NODE 59.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN) = 25.12
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.023
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL A 0.35 0.80 0.10 52
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.80
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA(ACRES) = 0.35 SUBAREA RUNOFF(CFS) = 0.61
 EFFECTIVE AREA(ACRES) = 107.70 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.81
 TOTAL AREA(ACRES) = 107.70 PEAK FLOW RATE(CFS) = 181.42
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 59.00 TO NODE 59.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN) = 25.12
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.023
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH" B 0.15 0.31 1.00 84
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.31
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 0.15 SUBAREA RUNOFF(CFS) = 0.23
 EFFECTIVE AREA(ACRES) = 107.85 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.81
 TOTAL AREA(ACRES) = 107.85 PEAK FLOW RATE(CFS) = 181.42
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 59.00 TO NODE 59.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN) = 25.12
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.023
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH" A 0.05 0.61 1.00 66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 0.05 SUBAREA RUNOFF(CFS) = 0.06
 EFFECTIVE AREA(ACRES) = 107.90 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.81

TOTAL AREA(ACRES) = 107.90 PEAK FLOW RATE(CFS) = 181.42
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

FLOW PROCESS FROM NODE 59.00 TO NODE 60.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 903.68 DOWNSTREAM(FEET) = 901.77
FLOW LENGTH(FEET) = 383.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 63.0 INCH PIPE IS 46.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 10.66
ESTIMATED PIPE DIAMETER(INCH) = 63.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 181.42
PIPE TRAVEL TIME(MIN.) = 0.60 Tc(MIN.) = 25.72
LONGEST FLOWPATH FROM NODE 50.00 TO NODE 60.00 = 5602.00 FEET.

FLOW PROCESS FROM NODE 60.00 TO NODE 60.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 25.72
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.995
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL A 0.40 0.80 0.10 52
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.80
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
SUBAREA AREA(ACRES) = 0.40 SUBAREA RUNOFF(CFS) = 0.69
EFFECTIVE AREA(ACRES) = 108.30 AREA-AVERAGED Fm(INCH/HR) = 0.19
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.80
TOTAL AREA(ACRES) = 108.30 PEAK FLOW RATE(CFS) = 181.42
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

FLOW PROCESS FROM NODE 60.00 TO NODE 60.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 25.72
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.995
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL B 0.15 0.45 0.10 76
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
SUBAREA AREA(ACRES) = 0.15 SUBAREA RUNOFF(CFS) = 0.26
EFFECTIVE AREA(ACRES) = 108.45 AREA-AVERAGED Fm(INCH/HR) = 0.19
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.80
TOTAL AREA(ACRES) = 108.45 PEAK FLOW RATE(CFS) = 181.42
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

FLOW PROCESS FROM NODE 60.00 TO NODE 60.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 25.72
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.995
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"OPEN BRUSH" A 0.20 0.61 1.00 66
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 0.20 SUBAREA RUNOFF(CFS) = 0.25
EFFECTIVE AREA(ACRES) = 108.65 AREA-AVERAGED Fm(INCH/HR) = 0.19
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.80
TOTAL AREA(ACRES) = 108.65 PEAK FLOW RATE(CFS) = 181.42
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

FLOW PROCESS FROM NODE 60.00 TO NODE 60.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 25.72
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.995
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"OPEN BRUSH" B 0.15 0.31 1.00 84
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.31
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 0.15 SUBAREA RUNOFF(CFS) = 0.23
EFFECTIVE AREA(ACRES) = 108.80 AREA-AVERAGED Fm(INCH/HR) = 0.19
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.80
TOTAL AREA(ACRES) = 108.80 PEAK FLOW RATE(CFS) = 181.42
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

FLOW PROCESS FROM NODE 60.00 TO NODE 61.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 901.77 DOWNSTREAM(FEET) = 898.42
PIPE LENGTH(FEET) = 530.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 60.0 INCH PIPE IS 44.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 11.63
ESTIMATED PIPE DIAMETER(INCH) = 60.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 181.42
PIPE TRAVEL TIME(MIN.) = 0.76 Tc(MIN.) = 26.48
LONGEST FLOWPATH FROM NODE 50.00 TO NODE 61.00 = 6132.00 FEET.

FLOW PROCESS FROM NODE 61.00 TO NODE 61.00 IS CODE = 81
=====

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

MAINLINE Tc(MIN) = 26.48
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.960
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL B 0.40 0.45 0.10 76
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
SUBAREA AREA(ACRES) = 0.40 SUBAREA RUNOFF(CFS) = 0.69
EFFECTIVE AREA(ACRES) = 109.20 AREA-AVERAGED Fm(INCH/HR) = 0.19
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.80
TOTAL AREA(ACRES) = 109.20 PEAK FLOW RATE(CFS) = 181.42
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

FLOW PROCESS FROM NODE 61.00 TO NODE 61.00 IS CODE = 81
=====

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

MAINLINE Tc(MIN) = 26.48
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.960
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL B 0.30 0.45 0.10 76
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
SUBAREA AREA(ACRES) = 0.30 SUBAREA RUNOFF(CFS) = 0.52
EFFECTIVE AREA(ACRES) = 109.50 AREA-AVERAGED Fm(INCH/HR) = 0.19
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.80
TOTAL AREA(ACRES) = 109.50 PEAK FLOW RATE(CFS) = 181.42
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

FLOW PROCESS FROM NODE 61.00 TO NODE 61.00 IS CODE = 81
=====

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

MAINLINE Tc(MIN) = 26.48
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.960
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"OPEN BRUSH" B 0.30 0.31 1.00 84
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.31
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 0.30 SUBAREA RUNOFF(CFS) = 0.45
EFFECTIVE AREA(ACRES) = 109.80 AREA-AVERAGED Fm(INCH/HR) = 0.19
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.80
TOTAL AREA(ACRES) = 109.80 PEAK FLOW RATE(CFS) = 181.42
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

FLOW PROCESS FROM NODE 61.00 TO NODE 61.00 IS CODE = 81
=====

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

MAINLINE Tc(MIN) = 26.48
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.960
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL B 0.60 0.45 0.10 76
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
SUBAREA AREA(ACRES) = 0.60 SUBAREA RUNOFF(CFS) = 1.03
EFFECTIVE AREA(ACRES) = 110.40 AREA-AVERAGED Fm(INCH/HR) = 0.19
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.79
TOTAL AREA(ACRES) = 110.40 PEAK FLOW RATE(CFS) = 181.42
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

FLOW PROCESS FROM NODE 61.00 TO NODE 61.00 IS CODE = 81
=====

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

MAINLINE Tc(MIN) = 26.48
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.960
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

COMMERCIAL A 0.15 0.80 0.10 52
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.80
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA(ACRES) = 0.15 SUBAREA RUNOFF(CFS) = 0.25
 EFFECTIVE AREA(ACRES) = 110.55 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.79
 TOTAL AREA(ACRES) = 110.55 PEAK FLOW RATE(CFS) = 181.42
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 61.00 TO NODE 61.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 26.48
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.960
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH" B 0.15 0.31 1.00 84
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.31
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 0.15 SUBAREA RUNOFF(CFS) = 0.22
 EFFECTIVE AREA(ACRES) = 110.70 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.79
 TOTAL AREA(ACRES) = 110.70 PEAK FLOW RATE(CFS) = 181.42
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 61.00 TO NODE 61.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 26.48
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.960
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL B 0.50 0.45 0.10 76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA(ACRES) = 0.50 SUBAREA RUNOFF(CFS) = 0.86
 EFFECTIVE AREA(ACRES) = 111.20 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.79
 TOTAL AREA(ACRES) = 111.20 PEAK FLOW RATE(CFS) = 181.42
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 61.00 TO NODE 61.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 26.48
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.960
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL C 0.05 0.27 0.10 86
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA(ACRES) = 0.05 SUBAREA RUNOFF(CFS) = 0.09
 EFFECTIVE AREA(ACRES) = 111.25 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.79
 TOTAL AREA(ACRES) = 111.25 PEAK FLOW RATE(CFS) = 181.42
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 61.00 TO NODE 61.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 26.48
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.960
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH" A 0.20 0.61 1.00 66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 0.20 SUBAREA RUNOFF(CFS) = 0.24
 EFFECTIVE AREA(ACRES) = 111.45 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.79
 TOTAL AREA(ACRES) = 111.45 PEAK FLOW RATE(CFS) = 181.42
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 61.00 TO NODE 73.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 898.42 DOWNSTREAM(FEET) = 895.00
 FLOW LENGTH(FEET) = 132.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 35.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 19.56
 ESTIMATED PIPE DIAMETER(INCH) = 45.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 181.42

PIPE TRAVEL TIME(MIN.) = 0.11 Tc(MIN.) = 26.60
LONGEST FLOWPATH FROM NODE 50.00 TO NODE 73.00 = 6264.00 FEET.

FLOW PROCESS FROM NODE 73.00 TO NODE 73.00 IS CODE = 10

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

FLOW PROCESS FROM NODE 70.00 TO NODE 71.00 IS CODE = 21

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 570.00
ELEVATION DATA: UPSTREAM(FEET) = 950.00 DOWNSTREAM(FEET) = 919.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 6.889
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.397
SUBAREA Tc AND LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
COMMERCIAL C 0.05 0.27 0.10 86 6.89
COMMERCIAL B 0.15 0.45 0.10 76 6.89
NATURAL FAIR COVER
"OPEN BRUSH" B 0.05 0.31 1.00 84 16.00
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.34
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.28
SUBAREA RUNOFF(CFS) = 0.97
TOTAL AREA(ACRES) = 0.25 PEAK FLOW RATE(CFS) = 0.97

FLOW PROCESS FROM NODE 70.00 TO NODE 71.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 6.89
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.397
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"2 DWELLINGS/ACRE" C 3.15 0.27 0.70 86
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
SUBAREA AREA(ACRES) = 3.15 SUBAREA RUNOFF(CFS) = 11.93
EFFECTIVE AREA(ACRES) = 3.40 AREA-AVERAGED Fm(INCH/HR) = 0.18
AREA-AVERAGED Fp(INCH/HR) = 0.27 AREA-AVERAGED Ap = 0.67
TOTAL AREA(ACRES) = 3.40 PEAK FLOW RATE(CFS) = 12.90

FLOW PROCESS FROM NODE 70.00 TO NODE 71.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 6.89
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.397
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"2 DWELLINGS/ACRE" B 1.85 0.45 0.70 76
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.70
SUBAREA AREA(ACRES) = 1.85 SUBAREA RUNOFF(CFS) = 6.79
EFFECTIVE AREA(ACRES) = 5.25 AREA-AVERAGED Fm(INCH/HR) = 0.23
AREA-AVERAGED Fp(INCH/HR) = 0.34 AREA-AVERAGED Ap = 0.68
TOTAL AREA(ACRES) = 5.25 PEAK FLOW RATE(CFS) = 19.69

FLOW PROCESS FROM NODE 71.00 TO NODE 72.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 913.00 DOWNSTREAM(FEET) = 896.00
FLOW LENGTH(FEET) = 70.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 15.0 INCH PIPE IS 8.7 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 26.77
ESTIMATED PIPE DIAMETER(INCH) = 15.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 19.69
PIPE TRAVEL TIME(MIN.) = 0.04 Tc(MIN.) = 6.93
LONGEST FLOWPATH FROM NODE 70.00 TO NODE 72.00 = 640.00 FEET.

FLOW PROCESS FROM NODE 72.00 TO NODE 72.00 IS CODE = 1

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

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 6.93
RAINFALL INTENSITY(INCH/HR) = 4.38
AREA-AVERAGED Fm(INCH/HR) = 0.23
AREA-AVERAGED Fp(INCH/HR) = 0.34
AREA-AVERAGED Ap = 0.68
EFFECTIVE STREAM AREA(ACRES) = 5.25

TOTAL STREAM AREA(ACRES) = 5.25
PEAK FLOW RATE(CFS) AT CONFLUENCE = 19.69

FLOW PROCESS FROM NODE 72.00 TO NODE 72.00 IS CODE = 7

>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<

=====

USER-SPECIFIED VALUES ARE AS FOLLOWS:
TC(MIN.) = 12.79 RAINFALL INTENSITY(INCH/HR) = 3.03
EFFECTIVE AREA(ACRES) = 27.64
TOTAL AREA(ACRES) = 30.45 PEAK FLOW RATE(CFS) = 72.37
AREA-AVERAGED Fm(INCH/HR) = 0.17 AREA-AVERAGED Fp(INCH/HR) = 0.37
AREA-AVERAGED Ap = 0.47
NOTE: EFFECTIVE AREA IS USED AS THE TOTAL CONTRIBUTING AREA FOR ALL
CONFLUENCE ANALYSES.

FLOW PROCESS FROM NODE 72.00 TO NODE 72.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 12.79
RAINFALL INTENSITY(INCH/HR) = 3.03
AREA-AVERAGED Fm(INCH/HR) = 0.17
AREA-AVERAGED Fp(INCH/HR) = 0.37
AREA-AVERAGED Ap = 0.47
EFFECTIVE STREAM AREA(ACRES) = 27.64
TOTAL STREAM AREA(ACRES) = 30.45
PEAK FLOW RATE(CFS) AT CONFLUENCE = 72.37

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19.69	6.93	4.381	0.34(0.23)	0.68	5.3	70.00
2	72.37	12.79	3.034	0.37(0.17)	0.47	27.6	72.00

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	77.39	6.93	4.381	0.36(0.19)	0.52	20.2	70.00
2	85.67	12.79	3.034	0.36(0.18)	0.50	32.9	72.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 85.67 Tc(MIN.) = 12.79
EFFECTIVE AREA(ACRES) = 32.89 AREA-AVERAGED Fm(INCH/HR) = 0.18
AREA-AVERAGED Fp(INCH/HR) = 0.36 AREA-AVERAGED Ap = 0.50
TOTAL AREA(ACRES) = 35.70
LONGEST FLOWPATH FROM NODE 70.00 TO NODE 72.00 = 640.00 FEET.

FLOW PROCESS FROM NODE 72.00 TO NODE 73.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 896.00 DOWNSTREAM(FEET) = 895.00
FLOW LENGTH(FEET) = 89.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 42.0 INCH PIPE IS 29.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 12.07
ESTIMATED PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 85.67
PIPE TRAVEL TIME(MIN.) = 0.12 Tc(MIN.) = 12.91
LONGEST FLOWPATH FROM NODE 70.00 TO NODE 73.00 = 729.00 FEET.

FLOW PROCESS FROM NODE 73.00 TO NODE 73.00 IS CODE = 11

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

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	77.39	7.06	4.333	0.36(0.19)	0.52	20.2	70.00
2	85.67	12.91	3.016	0.36(0.18)	0.50	32.9	72.00

LONGEST FLOWPATH FROM NODE 70.00 TO NODE 73.00 = 729.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	181.42	26.60	1.955	0.24(0.19)	0.79	111.5	50.00

LONGEST FLOWPATH FROM NODE 0.00 TO NODE 73.00 = 0.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	190.51	7.06	4.333	0.28(0.19)	0.68	49.8	70.00
2	226.77	12.91	3.016	0.28(0.19)	0.68	87.0	72.00
3	235.01	26.60	1.955	0.26(0.19)	0.73	144.3	50.00

TOTAL AREA(ACRES) = 147.15

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 235.01 Tc(MIN.) = 26.596
 EFFECTIVE AREA(ACRES) = 144.34 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.73
 TOTAL AREA(ACRES) = 147.15
 LONGEST FLOWPATH FROM NODE 70.00 TO NODE 73.00 = 729.00 FEET.

 FLOW PROCESS FROM NODE 73.00 TO NODE 73.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

 FLOW PROCESS FROM NODE 73.00 TO NODE 74.00 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) = 891.87
 FLOW LENGTH(FEET) = 121.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 51.0 INCH PIPE IS 37.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 21.08
 ESTIMATED PIPE DIAMETER(INCH) = 51.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 235.01
 PIPE TRAVEL TIME(MIN.) = 0.10 Tc(MIN.) = 26.69
 LONGEST FLOWPATH FROM NODE 70.00 TO NODE 74.00 = 850.00 FEET.

 FLOW PROCESS FROM NODE 74.00 TO NODE 74.00 IS CODE = 81

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

 MAINLINE Tc(MIN) = 26.69
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.951
 SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	1.20	0.45	0.10	76

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA(ACRES) = 1.20 SUBAREA RUNOFF(CFS) = 2.06
 EFFECTIVE AREA(ACRES) = 145.54 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.72
 TOTAL AREA(ACRES) = 148.35 PEAK FLOW RATE(CFS) = 235.01
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 74.00 TO NODE 74.00 IS CODE = 81

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

 MAINLINE Tc(MIN) = 26.69
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.951
 SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	A	0.40	0.80	0.10	52

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.80
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA(ACRES) = 0.40 SUBAREA RUNOFF(CFS) = 0.67
 EFFECTIVE AREA(ACRES) = 145.94 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.72
 TOTAL AREA(ACRES) = 148.75 PEAK FLOW RATE(CFS) = 235.01
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 74.00 TO NODE 74.00 IS CODE = 81

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

 MAINLINE Tc(MIN) = 26.69
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.951
 SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "OPEN BRUSH"	A	0.10	0.61	1.00	66

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 0.10 SUBAREA RUNOFF(CFS) = 0.12
 EFFECTIVE AREA(ACRES) = 146.04 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.72
 TOTAL AREA(ACRES) = 148.85 PEAK FLOW RATE(CFS) = 235.01
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 74.00 TO NODE 74.00 IS CODE = 81

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

 MAINLINE Tc(MIN) = 26.69
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.951
 SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	0.30	0.45	0.10	76

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.45
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.10
 SUBAREA AREA(ACRES) = 0.30 SUBAREA RUNOFF(CFS) = 0.51

EFFECTIVE AREA(ACRES) = 146.34 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.72
 TOTAL AREA(ACRES) = 149.15 PEAK FLOW RATE(CFS) = 235.01
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 74.00 TO NODE 74.00 IS CODE = 81

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

MAINLINE Tc(MIN) = 26.69
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.951
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH" B 0.10 0.31 1.00 84
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.31
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
 SUBAREA AREA(ACRES) = 0.10 SUBAREA RUNOFF(CFS) = 0.15
 EFFECTIVE AREA(ACRES) = 146.44 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.72
 TOTAL AREA(ACRES) = 149.25 PEAK FLOW RATE(CFS) = 235.01
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 74.00 TO NODE 75.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 891.87 DOWNSTREAM(FEET) = 887.60
 FLOW LENGTH(FEET) = 165.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 51.0 INCH PIPE IS 37.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 21.08
 ESTIMATED PIPE DIAMETER(INCH) = 51.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 235.01
 PIPE TRAVEL TIME(MIN.) = 0.13 Tc(MIN.) = 26.82
 LONGEST FLOWPATH FROM NODE 70.00 TO NODE 75.00 = 1015.00 FEET.

END OF STUDY SUMMARY:
 TOTAL AREA(ACRES) = 149.25 TC(MIN.) = 26.82
 EFFECTIVE AREA(ACRES) = 146.44 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.72
 PEAK FLOW RATE(CFS) = 235.01

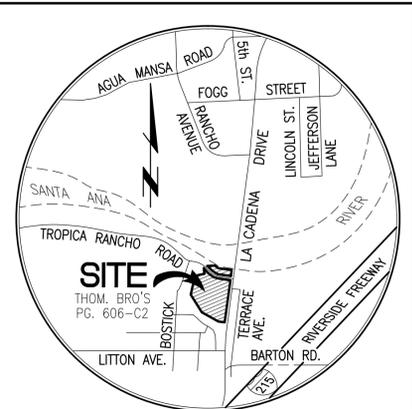
** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	192.02	7.30	4.248	0.28 (0.19)	0.66	51.9	70.00
2	226.77	13.14	2.985	0.28 (0.19)	0.67	89.1	72.00
3	235.01	26.82	1.945	0.26 (0.19)	0.72	146.4	50.00

END OF RATIONAL METHOD ANALYSIS

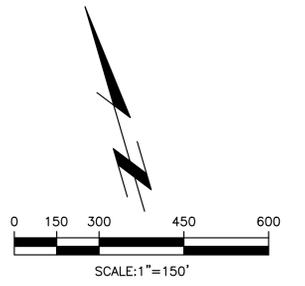
APPENDIX C

HYDROLOGY MAP



VICINITY MAP
N.T.S.

LEGEND	
	PROJECT BOUNDARY
	SUBAREA BOUNDARY
	SUBAREA AREA
	NODE NUMBER
Tc	TIME OF CONCENTRATION
Q 100	DISCHARGE (CUBIC FEET PER SECOND) NUMBER DESIGNATE YEAR OF FREQUENCY
	FLOW LINE



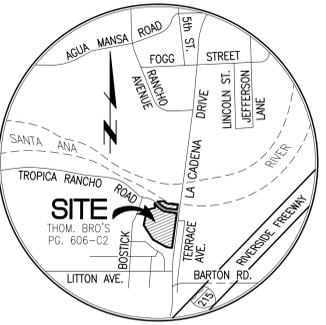
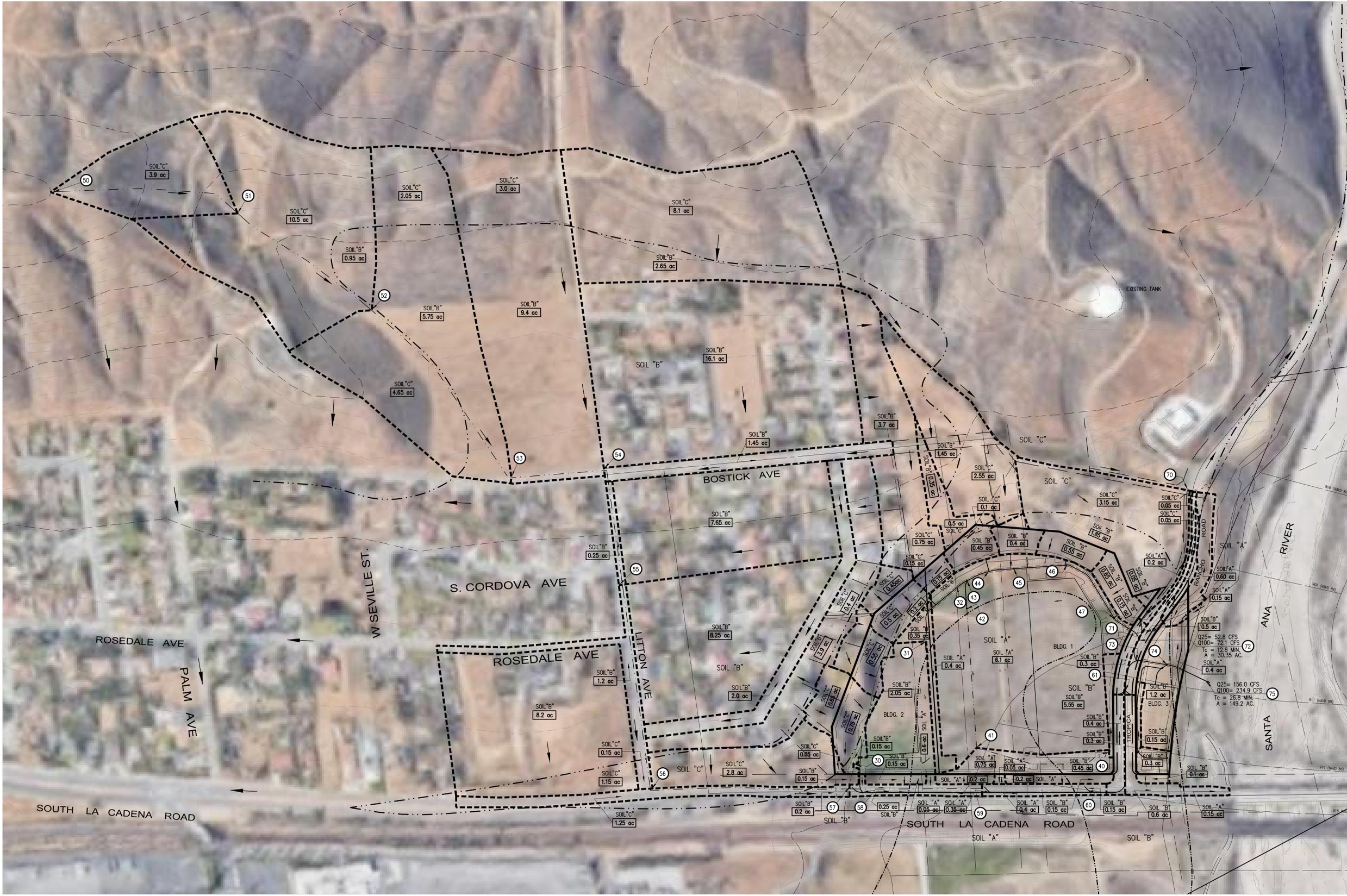
CITY OF COLTON PUBLIC WORKS DEPARTMENT	
HYDROLOGY MAP (EXISTING CONDITION) TRANSTECH TROPICA RANCH ROAD	
DESIGN BY: _____	Approved by: _____ Date: _____
CHECKED BY: _____	Public Works Director R.C.E. _____
DATE: _____	Sheet 1 of 1 Sheets

PREPARED FOR:
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Last Update: 3/14/17
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3535 / 1 of 1 SHEET



VICINITY MAP
N.T.S.

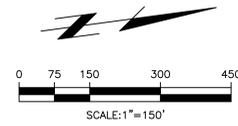
LEGEND	
	PROJECT BOUNDARY
	SUBAREA BOUNDARY
	SUBAREA AREA
	NODE NUMBER
T _c	TIME OF CONCENTRATION
Q ₁₀₀	DISCHARGE (CUBIC FEET PER SECOND) NUMBER DESIGNATE YEAR OF FREQUENCY
	FLOW LINE

CITY OF COLTON
PUBLIC WORKS DEPARTMENT

**HYDROLOGY MAP
(PROPOSED CONDITION)
TRANSTECH
TROPICA RANCH ROAD**

DESIGN BY: _____	Approved by: _____	Date: _____
DATE: _____	Public Works Director	R.C.E.
CHECKED BY: _____		
DATE: _____		

Sheet **1** of **1** Sheets



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Last Update: 4/24/17
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