

DRAINAGE AREA	DISCHARGE NODE	Q ₂ (CFS)	Q ₁₀ (CFS)	Q ₁₀₀ (CFS)	AREA (ACRES)	T _{CD} (MIN)	T _{CD10} (MIN)	T _{CD100} (MIN)
A	17	5.31	10.23	16.22	3.87	8.19	7.21	6.70
B	29.2	11.75	22.61	35.54	9.47	11.62	10.40	9.89
C	91	1.24	2.23	3.41	0.77	7.40	7.40	7.40
D	101	1.19	2.14	3.27	0.77	7.95	7.95	7.95
E	35	7.59	13.81	21.19	4.74	8.01	7.20	6.86
F	42	0.65	1.17	1.81	0.59	14.01	14.22	14.01
G	82	2.19	3.95	6.03	1.16	6.08	5.90	5.80
H	60	26.08	48.42	75.29	19.02	8.00	7.50	7.14
I	111	1.25	2.26	3.46	0.76	7.04	7.04	7.04
TOTAL		57.25	106.82	166.22	41.15			

NOTES

SOIL TYPE C All project area is Commercial land use
OUTFALL #5 IS SKIPPED IN ORDER FOR EFFICIENT COMPARISON WITH THE PROPOSED CONDITION

DRAINAGE PATTERN ACREAGE

NORTH [DRAINAGE AREA A, B, C] - 18.91 AC
SOUTH [DRAINAGE AREA D, E, F, G] - 22.24 AC

ASSESSOR PARCEL NO.

412-131-12, 412-131-13, 412-131-14, 412-131-16,
412-131-17, 412-131-22, 412-131-24, 412-131-25
AND 412-131-26

SITE ADDRESS

3600, 3810 & 3930 S BRISTOL STREET
SANTA ANA, CALIFORNIA

DEVELOPER

RELATED CALIFORNIA RESIDENTIAL, LLC
18201 VON KARMAN AVENUE, SUITE 900
IRVINE, CA 92612
TEL: 949.660.7272

CIVIL ENGINEER

FUSCOE ENGINEERING
16795 VON KARMAN, SUITE 100
IRVINE, CA 92606
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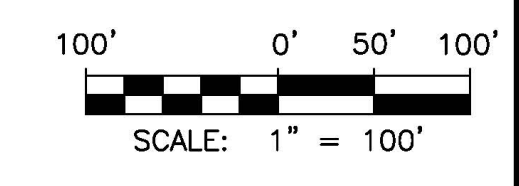
ABBREVIATIONS

- AC ACRE
- AC-FT ACRE-FOOT
- CFS CUBIC FEET PER SECOND
- COSA CITY OF SANTA ANA
- ELEV ELEVATION
- HP HIGH POINT
- L LENGTH
- MIN MINUTES
- OCFCD ORANGE COUNTY FLOOD CONTROL DISTRICT
- Q₂ FLOW RATE - 2-YEAR STORM
- S SLOPE
- T_c TIME OF CONCENTRATION

LEGEND

- DRAINAGE BOUNDARY
- DRAINAGE SUB-BOUNDARY
- NODE
- TIME OF CONCENTRATION FLOW PATH
- FLOW PATH LENGTH
- DRAINAGE BOUNDARY DESIGNATION AND AREA
- EXISTING STORM DRAIN
- DRAINAGE AREA A
- DRAINAGE AREA B
- DRAINAGE AREA C
- DRAINAGE AREA D
- DRAINAGE AREA E
- DRAINAGE AREA F
- DRAINAGE AREA G
- DRAINAGE AREA H
- DRAINAGE AREA I

Line	Outfall #	Existing SD	Existing		Proposed		Difference (Proposed - Existing)
			Acreeage	Q10 (cfs)	Acreeage	Q10 (cfs)	
MacArthur Boulevard	#1	30" lateral to 63" SD (Dwg. No. HF-47-12)					
	#2	30" lateral to 63" SD (Dwg. No. I-36-9)	14.11 ac	35 cfs	13.1 cfs	32.7 cfs	-2.3
Bristol Street	#3	24" lateral (Dwg. No. I-13-8)	6.1 ac	17.1 cfs	5.78 ac	13.2 cfs	-3.9
Plaza Drive	#4	36" S D (Dwg. No. HF-47-12)	1.16 ac	4 cfs	1.1 ac	2.6 cfs	-1.4
Sunflower	#5	54" SD (Dwg. No. HF-18-58)	19.78 ac	50.7 cfs	21.1 cfs	49.6 cfs	-1.1
	#6						
#7							
Total			41.15 ac	106.8 cfs	41.15 ac	98.2 cfs	For all lines, the proposed condition Q is less than the existing



Prepared for
(Developer/Applicant):

RCR BRISTOL, LLC
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**HYDROLOGY MAP
EXISTING CONDITION
RELATED BRISTOL
CITY OF SANTA ANA, CALIFORNIA**

PROJECT NO. 622-015
SHEET 1 OF 1

Appendix 7

Rational Method Calculations Proposed Condition

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
 (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
 (c) Copyright 1983-2014 Advanced Engineering Software (aes)
 Ver. 21.0 Release Date: 06/01/2014 License ID 1355

Analysis prepared by:

Fuscoe Engineering
 16795 Von Karman
 Suite 100
 Irvine, CA 92606

***** DESCRIPTION OF STUDY *****

* RELATED BRISTOL *
 * 2-YEAR STORM EVENT *
 * PROPOSED CONDITION *

FILE NAME: BRIS2PR.DAT
 TIME/DATE OF STUDY: 09:11 02/02/2023

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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

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

USER SPECIFIED STORM EVENT(YEAR) = 2.00
 SPECIFIED MINIMUM PIPE SIZE(INCH) = 8.00
 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
 DATA BANK RAINFALL USED
 ANTECEDENT MOISTURE CONDITION (AMC) I ASSUMED FOR RATIONAL METHOD

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

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

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
 1. Relative Flow-Depth = 0.00 FEET
 as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
 2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)
 *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
 OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
 *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

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+-----+
| AREA 'A' |
|         |
+-----+
  
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FLOW PROCESS FROM NODE 10.00 TO NODE 11.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 327.00
 ELEVATION DATA: UPSTREAM(FEET) = 38.30 DOWNSTREAM(FEET) = 35.00

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Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.725
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.763
 SUBAREA Tc AND LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL	C	1.71	0.25	0.100	50	7.73

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 2.68
 TOTAL AREA(ACRES) = 1.71 PEAK FLOW RATE(CFS) = 2.68

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+-----+
| AREA 'B' |
+-----+
  
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 FLOW PROCESS FROM NODE 20.00 TO NODE 21.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 35.40 DOWNSTREAM(FEET) = 31.40

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.474
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.797
 SUBAREA Tc AND LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL	C	2.28	0.25	0.100	50	7.47

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 3.64
 TOTAL AREA(ACRES) = 2.28 PEAK FLOW RATE(CFS) = 3.64

 FLOW PROCESS FROM NODE 21.00 TO NODE 21.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION(MIN.) = 7.47
 RAINFALL INTENSITY(INCH/HR) = 1.80
 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 2.28
 TOTAL STREAM AREA(ACRES) = 2.28
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 3.64

 FLOW PROCESS FROM NODE 22.00 TO NODE 23.00 IS CODE = 21

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

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INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 35.20 DOWNSTREAM(FEET) = 33.60

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.978
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.618
 SUBAREA Tc AND LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS GROUP	SOIL (ACRES)	AREA	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL	C	0.98	0.25	0.100	50	8.98	

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 1.40
 TOTAL AREA(ACRES) = 0.98 PEAK FLOW RATE(CFS) = 1.40

 FLOW PROCESS FROM NODE 23.00 TO NODE 21.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 28.50 DOWNSTREAM(FEET) = 27.40
 FLOW LENGTH(FEET) = 351.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 12.0 INCH PIPE IS 7.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 2.64
 ESTIMATED PIPE DIAMETER(INCH) = 12.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 1.40
 PIPE TRAVEL TIME(MIN.) = 2.22 Tc(MIN.) = 11.19
 LONGEST FLOWPATH FROM NODE 22.00 TO NODE 21.00 = 681.00 FEET.

 FLOW PROCESS FROM NODE 21.00 TO NODE 21.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 11.19
 RAINFALL INTENSITY(INCH/HR) = 1.43
 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 0.98
 TOTAL STREAM AREA(ACRES) = 0.98
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 1.40

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3.64	7.47	1.797	0.25(0.03)	0.10	2.3	20.00
2	1.40	11.19	1.425	0.25(0.03)	0.10	1.0	22.00

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	4.82	7.47	1.797	0.25(0.03)	0.10	2.9	20.00
2	4.28	11.19	1.425	0.25(0.03)	0.10	3.3	22.00

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COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 4.82 Tc(MIN.) = 7.47
 EFFECTIVE AREA(ACRES) = 2.93 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 3.3
 LONGEST FLOWPATH FROM NODE 22.00 TO NODE 21.00 = 681.00 FEET.

FLOW PROCESS FROM NODE 21.00 TO NODE 21.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN.) = 7.47
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.797
 SUBAREA LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	C	1.09	0.25	0.850	50

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.850
 SUBAREA AREA(ACRES) = 1.09 SUBAREA RUNOFF(CFS) = 1.55
 EFFECTIVE AREA(ACRES) = 4.02 AREA-AVERAGED Fm(INCH/HR) = 0.08
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.30
 TOTAL AREA(ACRES) = 4.3 PEAK FLOW RATE(CFS) = 6.23

FLOW PROCESS FROM NODE 21.00 TO NODE 24.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 27.40 DOWNSTREAM(FEET) = 26.10
 FLOW LENGTH(FEET) = 442.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 21.0 INCH PIPE IS 13.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 3.73
 ESTIMATED PIPE DIAMETER(INCH) = 21.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 6.23
 PIPE TRAVEL TIME(MIN.) = 1.97 Tc(MIN.) = 9.45
 LONGEST FLOWPATH FROM NODE 22.00 TO NODE 24.00 = 1123.00 FEET.

FLOW PROCESS FROM NODE 24.00 TO NODE 24.00 IS CODE = 10

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

=====

FLOW PROCESS FROM NODE 25.00 TO NODE 26.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 316.00
 ELEVATION DATA: UPSTREAM(FEET) = 36.70 DOWNSTREAM(FEET) = 33.50

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.615
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.778
 SUBAREA Tc AND LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL	C	1.26	0.25	0.100	50	7.61

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SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 1.99
 TOTAL AREA(ACRES) = 1.26 PEAK FLOW RATE(CFS) = 1.99

FLOW PROCESS FROM NODE 26.00 TO NODE 27.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 30.30 DOWNSTREAM(FEET) = 29.20
 FLOW LENGTH(FEET) = 373.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 15.0 INCH PIPE IS 8.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 2.83
 ESTIMATED PIPE DIAMETER(INCH) = 15.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 1.99
 PIPE TRAVEL TIME(MIN.) = 2.20 Tc(MIN.) = 9.81
 LONGEST FLOWPATH FROM NODE 25.00 TO NODE 27.00 = 689.00 FEET.

FLOW PROCESS FROM NODE 27.00 TO NODE 27.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN.) = 9.81
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.537
 SUBAREA LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	1.06	0.25	0.100	50

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 1.06 SUBAREA RUNOFF(CFS) = 1.44
 EFFECTIVE AREA(ACRES) = 2.32 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 2.3 PEAK FLOW RATE(CFS) = 3.16

FLOW PROCESS FROM NODE 27.00 TO NODE 28.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 29.20 DOWNSTREAM(FEET) = 28.00
 FLOW LENGTH(FEET) = 258.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 15.0 INCH PIPE IS 9.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 3.74
 ESTIMATED PIPE DIAMETER(INCH) = 15.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 3.16
 PIPE TRAVEL TIME(MIN.) = 1.15 Tc(MIN.) = 10.96
 LONGEST FLOWPATH FROM NODE 25.00 TO NODE 28.00 = 947.00 FEET.

FLOW PROCESS FROM NODE 28.00 TO NODE 28.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION(MIN.) = 10.96
 RAINFALL INTENSITY(INCH/HR) = 1.44

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AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 2.32
 TOTAL STREAM AREA(ACRES) = 2.32
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 3.16

FLOW PROCESS FROM NODE 29.00 TO NODE 30.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 35.10 DOWNSTREAM(FEET) = 32.90

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.424
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.678
 SUBAREA Tc AND LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL	C	1.41	0.25	0.100	50	8.42

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 2.10
 TOTAL AREA(ACRES) = 1.41 PEAK FLOW RATE(CFS) = 2.10

FLOW PROCESS FROM NODE 30.00 TO NODE 31.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 32.90 DOWNSTREAM ELEVATION(FEET) = 32.10
 STREET LENGTH(FEET) = 158.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 30.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.018
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.018

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.62
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.41
 HALFSTREET FLOOD WIDTH(FEET) = 14.02
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.86
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.77
 STREET FLOW TRAVEL TIME(MIN.) = 1.42 Tc(MIN.) = 9.84
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.535

SUBAREA LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	2.24	0.25	0.100	50

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 2.24 SUBAREA RUNOFF(CFS) = 3.04

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 EFFECTIVE AREA(ACRES) = 3.65 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 3.7 PEAK FLOW RATE(CFS) = 4.96

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.45 HALFSTREET FLOOD WIDTH(FEET) = 16.05
 FLOW VELOCITY(FEET/SEC.) = 1.99 DEPTH*VELOCITY(FT*FT/SEC.) = 0.89
 LONGEST FLOWPATH FROM NODE 29.00 TO NODE 31.00 = 488.00 FEET.

 FLOW PROCESS FROM NODE 31.00 TO NODE 28.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 28.30 DOWNSTREAM(FEET) = 28.00
 FLOW LENGTH(FEET) = 29.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 5.64
 ESTIMATED PIPE DIAMETER(INCH) = 15.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 4.96
 PIPE TRAVEL TIME(MIN.) = 0.09 Tc(MIN.) = 9.93
 LONGEST FLOWPATH FROM NODE 29.00 TO NODE 28.00 = 517.00 FEET.

 FLOW PROCESS FROM NODE 28.00 TO NODE 28.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 9.93
 RAINFALL INTENSITY(INCH/HR) = 1.53
 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 3.65
 TOTAL STREAM AREA(ACRES) = 3.65
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 4.96

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3.16	10.96	1.443	0.25(0.03)	0.10	2.3	25.00
2	4.96	9.93	1.527	0.25(0.03)	0.10	3.7	29.00

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	7.99	9.93	1.527	0.25(0.02)	0.10	5.8	29.00
2	7.84	10.96	1.443	0.25(0.02)	0.10	6.0	25.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) = 7.99 Tc(MIN.) = 9.93
 EFFECTIVE AREA(ACRES) = 5.75 AREA-AVERAGED Fm(INCH/HR) = 0.02
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 6.0
 LONGEST FLOWPATH FROM NODE 25.00 TO NODE 28.00 = 947.00 FEET.

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 FLOW PROCESS FROM NODE 28.00 TO NODE 24.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 28.00 DOWNSTREAM(FEET) = 26.10
 FLOW LENGTH(FEET) = 82.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 8.54
 ESTIMATED PIPE DIAMETER(INCH) = 15.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 7.99
 PIPE TRAVEL TIME(MIN.) = 0.16 Tc(MIN.) = 10.09
 LONGEST FLOWPATH FROM NODE 25.00 TO NODE 24.00 = 1029.00 FEET.

 FLOW PROCESS FROM NODE 24.00 TO NODE 24.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN.) = 10.09
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.513
 SUBAREA LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	C	1.10	0.25	0.850	50

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.850
 SUBAREA AREA(ACRES) = 1.10 SUBAREA RUNOFF(CFS) = 1.29
 EFFECTIVE AREA(ACRES) = 6.85 AREA-AVERAGED Fm(INCH/HR) = 0.06
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.22
 TOTAL AREA(ACRES) = 7.1 PEAK FLOW RATE(CFS) = 8.99

 FLOW PROCESS FROM NODE 24.00 TO NODE 24.00 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	8.99	10.09	1.513	0.25(0.06)	0.22	6.9	29.00
2	8.76	11.12	1.431	0.25(0.05)	0.22	7.1	25.00

LONGEST FLOWPATH FROM NODE 25.00 TO NODE 24.00 = 1029.00 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	6.23	9.45	1.571	0.25(0.08)	0.30	4.0	20.00
2	5.30	13.31	1.291	0.25(0.07)	0.29	4.3	22.00

LONGEST FLOWPATH FROM NODE 22.00 TO NODE 24.00 = 1123.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14.99	9.45	1.571	0.25(0.06)	0.25	10.4	20.00
2	15.07	10.09	1.513	0.25(0.06)	0.25	10.9	29.00
3	14.59	11.12	1.431	0.25(0.06)	0.25	11.2	25.00
4	13.17	13.31	1.291	0.25(0.06)	0.24	11.4	22.00

TOTAL AREA(ACRES) = 11.4

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COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) = 15.07 Tc(MIN.) = 10.088
 EFFECTIVE AREA(ACRES) = 10.93 AREA-AVERAGED Fm(INCH/HR) = 0.06
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.25
 TOTAL AREA(ACRES) = 11.4
 LONGEST FLOWPATH FROM NODE 22.00 TO NODE 24.00 = 1123.00 FEET.

FLOW PROCESS FROM NODE 24.00 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) = 26.10 DOWNSTREAM(FEET) = 25.20
 FLOW LENGTH(FEET) = 292.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 27.0 INCH PIPE IS 20.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 4.66
 ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 15.07
 PIPE TRAVEL TIME(MIN.) = 1.04 Tc(MIN.) = 11.13
 LONGEST FLOWPATH FROM NODE 22.00 TO NODE 32.00 = 1415.00 FEET.

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+-----+
| AREA 'C' |
|         |
+-----+
  
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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) = 297.00
 ELEVATION DATA: UPSTREAM(FEET) = 33.80 DOWNSTREAM(FEET) = 33.40

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.120
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.431
 SUBAREA Tc AND LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL	C	2.91	0.25	0.100	50	11.12

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 3.68
 TOTAL AREA(ACRES) = 2.91 PEAK FLOW RATE(CFS) = 3.68

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

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

=====

MAINLINE Tc(MIN.) = 11.12
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.431
 SUBAREA LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	1.19	0.25	0.100	50

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

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SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 1.19 SUBAREA RUNOFF(CFS) = 1.51
 EFFECTIVE AREA(ACRES) = 4.10 AREA-AVERAGED Fm(INCH/HR) = 0.02
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 4.1 PEAK FLOW RATE(CFS) = 5.19

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

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

=====

MAINLINE Tc(MIN.) = 11.12
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.431
 SUBAREA LOSS RATE DATA(AMC I):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL C 1.68 0.25 0.100 50
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 1.68 SUBAREA RUNOFF(CFS) = 2.13
 EFFECTIVE AREA(ACRES) = 5.78 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 5.8 PEAK FLOW RATE(CFS) = 7.31

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 | AREA 'D' |
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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) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 35.20 DOWNSTREAM(FEET) = 34.50

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.592
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.471
 SUBAREA Tc AND LOSS RATE DATA(AMC I):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 COMMERCIAL C 1.10 0.25 0.100 50 10.59
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 1.43
 TOTAL AREA(ACRES) = 1.10 PEAK FLOW RATE(CFS) = 1.43

+-----+
 | AREA 'E' |
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 +-----+

FLOW PROCESS FROM NODE 60.00 TO NODE 61.00 IS CODE = 21

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

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=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 39.80 DOWNSTREAM(FEET) = 36.80

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.917
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.739
SUBAREA Tc AND LOSS RATE DATA(AMC I):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
COMMERCIAL C 2.23 0.25 0.100 50 7.92
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA RUNOFF(CFS) = 3.44
TOTAL AREA(ACRES) = 2.23 PEAK FLOW RATE(CFS) = 3.44
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*****
FLOW PROCESS FROM NODE 61.00 TO NODE 62.00 IS CODE = 31
```

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

```
=====
ELEVATION DATA: UPSTREAM(FEET) = 31.50 DOWNSTREAM(FEET) = 30.80
FLOW LENGTH(FEET) = 126.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 15.0 INCH PIPE IS 9.7 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.09
ESTIMATED PIPE DIAMETER(INCH) = 15.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 3.44
PIPE TRAVEL TIME(MIN.) = 0.51 Tc(MIN.) = 8.43
LONGEST FLOWPATH FROM NODE 60.00 TO NODE 62.00 = 456.00 FEET.
```

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*****
FLOW PROCESS FROM NODE 62.00 TO NODE 62.00 IS CODE = 1
```

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

```
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 8.43
RAINFALL INTENSITY(INCH/HR) = 1.68
AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.25
AREA-AVERAGED Ap = 0.10
EFFECTIVE STREAM AREA(ACRES) = 2.23
TOTAL STREAM AREA(ACRES) = 2.23
PEAK FLOW RATE(CFS) AT CONFLUENCE = 3.44
```

```
*****
FLOW PROCESS FROM NODE 63.00 TO NODE 64.00 IS CODE = 21
```

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

```
=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 275.00
ELEVATION DATA: UPSTREAM(FEET) = 36.40 DOWNSTREAM(FEET) = 34.60

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.860
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.746
SUBAREA Tc AND LOSS RATE DATA(AMC I):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
```

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 COMMERCIAL C 0.84 0.25 0.100 50 7.86
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 1.30
 TOTAL AREA(ACRES) = 0.84 PEAK FLOW RATE(CFS) = 1.30

 FLOW PROCESS FROM NODE 64.00 TO NODE 62.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 30.90 DOWNSTREAM(FEET) = 30.80
 FLOW LENGTH(FEET) = 19.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 12.0 INCH PIPE IS 6.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 3.17
 ESTIMATED PIPE DIAMETER(INCH) = 12.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 1.30
 PIPE TRAVEL TIME(MIN.) = 0.10 Tc(MIN.) = 7.96
 LONGEST FLOWPATH FROM NODE 63.00 TO NODE 62.00 = 294.00 FEET.

 FLOW PROCESS FROM NODE 62.00 TO NODE 62.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 7.96
 RAINFALL INTENSITY(INCH/HR) = 1.73
 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 0.84
 TOTAL STREAM AREA(ACRES) = 0.84
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 1.30

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3.44	8.43	1.677	0.25(0.03)	0.10	2.2	60.00
2	1.30	7.96	1.733	0.25(0.03)	0.10	0.8	63.00

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	4.66	7.96	1.733	0.25(0.03)	0.10	2.9	63.00
2	4.70	8.43	1.677	0.25(0.03)	0.10	3.1	60.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) = 4.70 Tc(MIN.) = 8.43
 EFFECTIVE AREA(ACRES) = 3.07 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 3.1
 LONGEST FLOWPATH FROM NODE 60.00 TO NODE 62.00 = 456.00 FEET.

 FLOW PROCESS FROM NODE 62.00 TO NODE 65.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 30.80 DOWNSTREAM(FEET) = 30.00
 FLOW LENGTH(FEET) = 251.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 3.56
 ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 4.70
 PIPE TRAVEL TIME(MIN.) = 1.17 Tc(MIN.) = 9.60
 LONGEST FLOWPATH FROM NODE 60.00 TO NODE 65.00 = 707.00 FEET.

 FLOW PROCESS FROM NODE 65.00 TO NODE 65.00 IS CODE = 1

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

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION(MIN.) = 9.60
 RAINFALL INTENSITY(INCH/HR) = 1.56
 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 3.07
 TOTAL STREAM AREA(ACRES) = 3.07
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 4.70

 FLOW PROCESS FROM NODE 63.00 TO NODE 66.00 IS CODE = 21

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 36.40 DOWNSTREAM(FEET) = 34.40

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.586
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.660
 SUBAREA Tc AND LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL	C	0.64	0.25	0.100	50	8.59

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 0.94
 TOTAL AREA(ACRES) = 0.64 PEAK FLOW RATE(CFS) = 0.94

 FLOW PROCESS FROM NODE 66.00 TO NODE 67.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<
 =====

UPSTREAM ELEVATION(FEET) = 34.40 DOWNSTREAM ELEVATION(FEET) = 33.80
 STREET LENGTH(FEET) = 110.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 30.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.018

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OUTSIDE STREET CROSSFALL(DECIMAL) = 0.018

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1.91

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.35

HALFSTREET FLOOD WIDTH(FEET) = 10.35

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.66

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.58

STREET FLOW TRAVEL TIME(MIN.) = 1.11 Tc(MIN.) = 9.69

* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.548

SUBAREA LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	1.41	0.25	0.100	50

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100

SUBAREA AREA(ACRES) = 1.41 SUBAREA RUNOFF(CFS) = 1.93

EFFECTIVE AREA(ACRES) = 2.05 AREA-AVERAGED Fm(INCH/HR) = 0.03

AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10

TOTAL AREA(ACRES) = 2.0 PEAK FLOW RATE(CFS) = 2.81

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.38 HALFSTREET FLOOD WIDTH(FEET) = 12.38

FLOW VELOCITY(FEET/SEC.) = 1.80 DEPTH*VELOCITY(FT*FT/SEC.) = 0.69

LONGEST FLOWPATH FROM NODE 63.00 TO NODE 67.00 = 440.00 FEET.

FLOW PROCESS FROM NODE 67.00 TO NODE 65.00 IS CODE = 31

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

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 30.10 DOWNSTREAM(FEET) = 30.00

FLOW LENGTH(FEET) = 12.00 MANNING'S N = 0.013

DEPTH OF FLOW IN 12.0 INCH PIPE IS 9.0 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 4.45

ESTIMATED PIPE DIAMETER(INCH) = 12.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) = 2.81

PIPE TRAVEL TIME(MIN.) = 0.04 Tc(MIN.) = 9.74

LONGEST FLOWPATH FROM NODE 63.00 TO NODE 65.00 = 452.00 FEET.

FLOW PROCESS FROM NODE 65.00 TO NODE 65.00 IS CODE = 1

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

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 9.74

RAINFALL INTENSITY(INCH/HR) = 1.54

AREA-AVERAGED Fm(INCH/HR) = 0.03

AREA-AVERAGED Fp(INCH/HR) = 0.25

AREA-AVERAGED Ap = 0.10

EFFECTIVE STREAM AREA(ACRES) = 2.05

TOTAL STREAM AREA(ACRES) = 2.05

PEAK FLOW RATE(CFS) AT CONFLUENCE = 2.81

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** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4.66	9.14	1.602	0.25(0.03)	0.10	2.9	63.00
1	4.70	9.60	1.556	0.25(0.03)	0.10	3.1	60.00
2	2.81	9.74	1.544	0.25(0.03)	0.10	2.0	63.00

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	7.40	9.14	1.602	0.25(0.03)	0.10	4.9	63.00
2	7.49	9.60	1.556	0.25(0.03)	0.10	5.1	60.00
3	7.47	9.74	1.544	0.25(0.03)	0.10	5.1	63.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) = 7.49 Tc(MIN.) = 9.60
 EFFECTIVE AREA(ACRES) = 5.09 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 5.1
 LONGEST FLOWPATH FROM NODE 60.00 TO NODE 65.00 = 707.00 FEET.

 FLOW PROCESS FROM NODE 65.00 TO NODE 68.00 IS CODE = 31

 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
 =====
 ELEVATION DATA: UPSTREAM(FEET) = 30.00 DOWNSTREAM(FEET) = 27.60
 FLOW LENGTH(FEET) = 189.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 18.0 INCH PIPE IS 10.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.80
 ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 7.49
 PIPE TRAVEL TIME(MIN.) = 0.46 Tc(MIN.) = 10.07
 LONGEST FLOWPATH FROM NODE 60.00 TO NODE 68.00 = 896.00 FEET.

+-----+
 | AREA 'F' |
 | |
 | |
 +-----+

 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) = 276.00
 ELEVATION DATA: UPSTREAM(FEET) = 35.40 DOWNSTREAM(FEET) = 34.20

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.542
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.665
 SUBAREA Tc AND LOSS RATE DATA(AMC I):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 COMMERCIAL C 1.72 0.25 0.100 50 8.54

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SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 2.54
 TOTAL AREA(ACRES) = 1.72 PEAK FLOW RATE(CFS) = 2.54

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

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

=====

MAINLINE Tc(MIN.) = 8.54
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.665
 SUBAREA LOSS RATE DATA(AMC I):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL C 0.82 0.25 0.100 50
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 0.82 SUBAREA RUNOFF(CFS) = 1.21
 EFFECTIVE AREA(ACRES) = 2.54 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 2.5 PEAK FLOW RATE(CFS) = 3.75

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

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

=====

MAINLINE Tc(MIN.) = 8.54
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.665
 SUBAREA LOSS RATE DATA(AMC I):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL C 1.53 0.25 0.100 50
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 1.53 SUBAREA RUNOFF(CFS) = 2.26
 EFFECTIVE AREA(ACRES) = 4.07 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 4.1 PEAK FLOW RATE(CFS) = 6.01

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) = 30.30 DOWNSTREAM(FEET) = 29.20
 FLOW LENGTH(FEET) = 426.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 21.0 INCH PIPE IS 14.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 3.52
 ESTIMATED PIPE DIAMETER(INCH) = 21.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 6.01
 PIPE TRAVEL TIME(MIN.) = 2.02 Tc(MIN.) = 10.56
 LONGEST FLOWPATH FROM NODE 70.00 TO NODE 72.00 = 702.00 FEET.

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

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

=====

TOTAL NUMBER OF STREAMS = 3

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CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 10.56
 RAINFALL INTENSITY(INCH/HR) = 1.47
 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 4.07
 TOTAL STREAM AREA(ACRES) = 4.07
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 6.01

FLOW PROCESS FROM NODE 73.00 TO NODE 74.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 35.50 DOWNSTREAM(FEET) = 33.50

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.167
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.506
 SUBAREA Tc AND LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
CONDOMINIUMS	C	1.24	0.25	0.350	50	10.17

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
 SUBAREA RUNOFF(CFS) = 1.58
 TOTAL AREA(ACRES) = 1.24 PEAK FLOW RATE(CFS) = 1.58

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

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

=====

MAINLINE Tc(MIN.) = 10.17
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.506
 SUBAREA LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	0.45	0.25	0.100	50

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 0.45 SUBAREA RUNOFF(CFS) = 0.60
 EFFECTIVE AREA(ACRES) = 1.69 AREA-AVERAGED Fm(INCH/HR) = 0.07
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.28
 TOTAL AREA(ACRES) = 1.7 PEAK FLOW RATE(CFS) = 2.18

FLOW PROCESS FROM NODE 74.00 TO NODE 75.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 33.50 DOWNSTREAM ELEVATION(FEET) = 33.30
 STREET LENGTH(FEET) = 51.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 30.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.018
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.018

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SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2.70
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.40
 HALFSTREET FLOOD WIDTH(FEET) = 13.09
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.57
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.62
 STREET FLOW TRAVEL TIME(MIN.) = 0.54 Tc(MIN.) = 10.71
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.462

SUBAREA LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
CONDOMINIUMS	C	0.84	0.25	0.350	50

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
 SUBAREA AREA(ACRES) = 0.84 SUBAREA RUNOFF(CFS) = 1.04
 EFFECTIVE AREA(ACRES) = 2.53 AREA-AVERAGED Fm(INCH/HR) = 0.08
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.31
 TOTAL AREA(ACRES) = 2.5 PEAK FLOW RATE(CFS) = 3.16

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.41 HALFSTREET FLOOD WIDTH(FEET) = 13.95
 FLOW VELOCITY(FEET/SEC.) = 1.63 DEPTH*VELOCITY(FT*FT/SEC.) = 0.67
 LONGEST FLOWPATH FROM NODE 73.00 TO NODE 75.00 = 381.00 FEET.

FLOW PROCESS FROM NODE 75.00 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) = 29.50 DOWNSTREAM(FEET) = 29.20
 FLOW LENGTH(FEET) = 16.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 12.0 INCH PIPE IS 7.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.34
 ESTIMATED PIPE DIAMETER(INCH) = 12.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 3.16
 PIPE TRAVEL TIME(MIN.) = 0.04 Tc(MIN.) = 10.75
 LONGEST FLOWPATH FROM NODE 73.00 TO NODE 72.00 = 397.00 FEET.

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

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

=====

TOTAL NUMBER OF STREAMS = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 10.75
 RAINFALL INTENSITY(INCH/HR) = 1.46
 AREA-AVERAGED Fm(INCH/HR) = 0.08
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.31
 EFFECTIVE STREAM AREA(ACRES) = 2.53
 TOTAL STREAM AREA(ACRES) = 2.53
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 3.16

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FLOW PROCESS FROM NODE 76.00 TO NODE 77.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 37.10 DOWNSTREAM(FEET) = 35.10

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.167
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.506
 SUBAREA Tc AND LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
CONDOMINIUMS	C	2.10	0.25	0.350	50	10.17

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
 SUBAREA RUNOFF(CFS) = 2.68
 TOTAL AREA(ACRES) = 2.10 PEAK FLOW RATE(CFS) = 2.68

FLOW PROCESS FROM NODE 77.00 TO NODE 78.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 35.10 DOWNSTREAM ELEVATION(FEET) = 34.30
 STREET LENGTH(FEET) = 119.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 30.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.018
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.018

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.62
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.40
 HALFSTREET FLOOD WIDTH(FEET) = 13.24
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.06
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.82
 STREET FLOW TRAVEL TIME(MIN.) = 0.96 Tc(MIN.) = 11.13
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.430

SUBAREA LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
CONDOMINIUMS	C	1.55	0.25	0.350	50

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
 SUBAREA AREA(ACRES) = 1.55 SUBAREA RUNOFF(CFS) = 1.87
 EFFECTIVE AREA(ACRES) = 3.65 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.35
 TOTAL AREA(ACRES) = 3.6 PEAK FLOW RATE(CFS) = 4.41

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.42 HALFSTREET FLOOD WIDTH(FEET) = 14.34
 FLOW VELOCITY(FEET/SEC.) = 2.17 DEPTH*VELOCITY(FT*FT/SEC.) = 0.91
 LONGEST FLOWPATH FROM NODE 76.00 TO NODE 78.00 = 449.00 FEET.

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FLOW PROCESS FROM NODE 78.00 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) = 29.50 DOWNSTREAM(FEET) = 29.20
 FLOW LENGTH(FEET) = 15.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 12.0 INCH PIPE IS 9.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.91
 ESTIMATED PIPE DIAMETER(INCH) = 12.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 4.41
 PIPE TRAVEL TIME(MIN.) = 0.04 Tc(MIN.) = 11.17
 LONGEST FLOWPATH FROM NODE 76.00 TO NODE 72.00 = 464.00 FEET.

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 = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 3 ARE:
 TIME OF CONCENTRATION(MIN.) = 11.17
 RAINFALL INTENSITY(INCH/HR) = 1.43
 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.35
 EFFECTIVE STREAM AREA(ACRES) = 3.65
 TOTAL STREAM AREA(ACRES) = 3.65
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 4.41

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6.01	10.56	1.474	0.25(0.03)	0.10	4.1	70.00
2	3.16	10.75	1.459	0.25(0.08)	0.31	2.5	73.00
3	4.41	11.17	1.427	0.25(0.09)	0.35	3.6	76.00

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13.45	10.56	1.474	0.25(0.06)	0.24	10.0	70.00
2	13.44	10.75	1.459	0.25(0.06)	0.24	10.1	73.00
3	13.31	11.17	1.427	0.25(0.06)	0.24	10.2	76.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) = 13.45 Tc(MIN.) = 10.56
 EFFECTIVE AREA(ACRES) = 10.01 AREA-AVERAGED Fm(INCH/HR) = 0.06
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.24
 TOTAL AREA(ACRES) = 10.2
 LONGEST FLOWPATH FROM NODE 70.00 TO NODE 72.00 = 702.00 FEET.

FLOW PROCESS FROM NODE 72.00 TO NODE 79.00 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) = 29.20 DOWNSTREAM(FEET) = 27.80
FLOW LENGTH(FEET) = 451.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 27.0 INCH PIPE IS 18.6 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.59
ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 13.45
PIPE TRAVEL TIME(MIN.) = 1.64 Tc(MIN.) = 12.20
LONGEST FLOWPATH FROM NODE 70.00 TO NODE 79.00 = 1153.00 FEET.
  
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FLOW PROCESS FROM NODE 79.00 TO NODE 79.00 IS CODE = 1
  
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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  
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TOTAL NUMBER OF STREAMS = 3
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 12.20
RAINFALL INTENSITY(INCH/HR) = 1.36
AREA-AVERAGED Fm(INCH/HR) = 0.06
AREA-AVERAGED Fp(INCH/HR) = 0.25
AREA-AVERAGED Ap = 0.24
EFFECTIVE STREAM AREA(ACRES) = 10.01
TOTAL STREAM AREA(ACRES) = 10.25
PEAK FLOW RATE(CFS) AT CONFLUENCE = 13.45
  
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FLOW PROCESS FROM NODE 76.00 TO NODE 80.00 IS CODE = 21
  
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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
  
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INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 37.10 DOWNSTREAM(FEET) = 35.10
  
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Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.167
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.506
SUBAREA Tc AND LOSS RATE DATA(AMC I ):
DEVELOPMENT TYPE/      SCS SOIL  AREA   Fp      Ap      SCS  Tc
LAND USE              GROUP  (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
CONDOMINIUMS         C      1.85    0.25    0.350   50  10.17
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
SUBAREA RUNOFF(CFS) = 2.36
TOTAL AREA(ACRES) = 1.85 PEAK FLOW RATE(CFS) = 2.36
  
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FLOW PROCESS FROM NODE 80.00 TO NODE 81.00 IS CODE = 62
  
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>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<
  
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UPSTREAM ELEVATION(FEET) = 35.10 DOWNSTREAM ELEVATION(FEET) = 33.90
STREET LENGTH(FEET) = 148.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 30.00
  
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```

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.018
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.018
  
```

```

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
  
```

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STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2.82
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.37
 HALFSTREET FLOOD WIDTH(FEET) = 11.37
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.09
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.77
 STREET FLOW TRAVEL TIME(MIN.) = 1.18 Tc(MIN.) = 11.35
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.414

SUBAREA LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
CONDOMINIUMS	C	0.77	0.25	0.350	50

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
 SUBAREA AREA(ACRES) = 0.77 SUBAREA RUNOFF(CFS) = 0.92
 EFFECTIVE AREA(ACRES) = 2.62 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.35
 TOTAL AREA(ACRES) = 2.6 PEAK FLOW RATE(CFS) = 3.13

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.38 HALFSTREET FLOOD WIDTH(FEET) = 11.91
 FLOW VELOCITY(FEET/SEC.) = 2.14 DEPTH*VELOCITY(FT*FT/SEC.) = 0.80
 LONGEST FLOWPATH FROM NODE 76.00 TO NODE 81.00 = 478.00 FEET.

 FLOW PROCESS FROM NODE 81.00 TO NODE 79.00 IS CODE = 31

 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
 =====
 ELEVATION DATA: UPSTREAM(FEET) = 28.10 DOWNSTREAM(FEET) = 27.80
 FLOW LENGTH(FEET) = 12.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 12.0 INCH PIPE IS 6.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 7.06
 ESTIMATED PIPE DIAMETER(INCH) = 12.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 3.13
 PIPE TRAVEL TIME(MIN.) = 0.03 Tc(MIN.) = 11.37
 LONGEST FLOWPATH FROM NODE 76.00 TO NODE 79.00 = 490.00 FEET.

 FLOW PROCESS FROM NODE 79.00 TO NODE 79.00 IS CODE = 1

 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 =====
 TOTAL NUMBER OF STREAMS = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 11.37
 RAINFALL INTENSITY(INCH/HR) = 1.41
 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.35
 EFFECTIVE STREAM AREA(ACRES) = 2.62
 TOTAL STREAM AREA(ACRES) = 2.62
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 3.13

 FLOW PROCESS FROM NODE 82.00 TO NODE 83.00 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) = 320.00
 ELEVATION DATA: UPSTREAM(FEET) = 36.40 DOWNSTREAM(FEET) = 33.90

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.546
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.562
 SUBAREA Tc AND LOSS RATE DATA(AMC I):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 CONDOMINIUMS C 1.10 0.25 0.350 50 9.55
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
 SUBAREA RUNOFF(CFS) = 1.46
 TOTAL AREA(ACRES) = 1.10 PEAK FLOW RATE(CFS) = 1.46

FLOW PROCESS FROM NODE 83.00 TO NODE 79.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 28.10 DOWNSTREAM(FEET) = 27.80
 FLOW LENGTH(FEET) = 10.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 9.0 INCH PIPE IS 4.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.26
 ESTIMATED PIPE DIAMETER(INCH) = 9.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 1.46
 PIPE TRAVEL TIME(MIN.) = 0.03 Tc(MIN.) = 9.57
 LONGEST FLOWPATH FROM NODE 82.00 TO NODE 79.00 = 330.00 FEET.

FLOW PROCESS FROM NODE 79.00 TO NODE 79.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 3 ARE:
 TIME OF CONCENTRATION(MIN.) = 9.57
 RAINFALL INTENSITY(INCH/HR) = 1.56
 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.35
 EFFECTIVE STREAM AREA(ACRES) = 1.10
 TOTAL STREAM AREA(ACRES) = 1.10
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 1.46

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13.45	12.20	1.357	0.25(0.06)	0.24	10.0	70.00
1	13.44	12.39	1.345	0.25(0.06)	0.24	10.1	73.00
1	13.31	12.81	1.319	0.25(0.06)	0.24	10.2	76.00
2	3.13	11.37	1.412	0.25(0.09)	0.35	2.6	76.00
3	1.46	9.57	1.559	0.25(0.09)	0.35	1.1	82.00

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

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** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16.59	9.57	1.559	0.25(0.07)	0.27	11.2	82.00
2	17.52	11.37	1.412	0.25(0.07)	0.27	13.1	76.00
3	17.71	12.20	1.357	0.25(0.07)	0.27	13.7	70.00
4	17.66	12.39	1.345	0.25(0.07)	0.27	13.8	73.00
5	17.44	12.81	1.319	0.25(0.07)	0.27	14.0	76.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 17.71 Tc(MIN.) = 12.20
 EFFECTIVE AREA(ACRES) = 13.73 AREA-AVERAGED Fm(INCH/HR) = 0.07
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.27
 TOTAL AREA(ACRES) = 14.0
 LONGEST FLOWPATH FROM NODE 70.00 TO NODE 79.00 = 1153.00 FEET.

 FLOW PROCESS FROM NODE 79.00 TO NODE 84.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 27.80 DOWNSTREAM(FEET) = 27.40
 FLOW LENGTH(FEET) = 144.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 30.0 INCH PIPE IS 21.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 4.70
 ESTIMATED PIPE DIAMETER(INCH) = 30.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 17.71
 PIPE TRAVEL TIME(MIN.) = 0.51 Tc(MIN.) = 12.71
 LONGEST FLOWPATH FROM NODE 70.00 TO NODE 84.00 = 1297.00 FEET.

 FLOW PROCESS FROM NODE 84.00 TO NODE 84.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN.) = 12.71
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.325
 SUBAREA LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	0.62	0.25	0.100	50

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 0.62 SUBAREA RUNOFF(CFS) = 0.73
 EFFECTIVE AREA(ACRES) = 14.35 AREA-AVERAGED Fm(INCH/HR) = 0.07
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.26
 TOTAL AREA(ACRES) = 14.6 PEAK FLOW RATE(CFS) = 17.71
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 84.00 TO NODE 85.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 27.40 DOWNSTREAM(FEET) = 27.30
 FLOW LENGTH(FEET) = 26.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 27.0 INCH PIPE IS 21.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 5.22
 ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 17.71

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 PIPE TRAVEL TIME(MIN.) = 0.08 Tc(MIN.) = 12.79
 LONGEST FLOWPATH FROM NODE 70.00 TO NODE 85.00 = 1323.00 FEET.

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+-----+
| AREA 'G' |
+-----+
  
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 FLOW PROCESS FROM NODE 90.00 TO NODE 91.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 253.00
 ELEVATION DATA: UPSTREAM(FEET) = 37.50 DOWNSTREAM(FEET) = 37.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.659
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.551
 SUBAREA Tc AND LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL	C	0.85	0.25	0.100	50	9.66

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 1.17
 TOTAL AREA(ACRES) = 0.85 PEAK FLOW RATE(CFS) = 1.17

 FLOW PROCESS FROM NODE 91.00 TO NODE 92.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 32.50 DOWNSTREAM(FEET) = 31.00
 FLOW LENGTH(FEET) = 152.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 9.0 INCH PIPE IS 5.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 3.87
 ESTIMATED PIPE DIAMETER(INCH) = 9.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 1.17
 PIPE TRAVEL TIME(MIN.) = 0.65 Tc(MIN.) = 10.31
 LONGEST FLOWPATH FROM NODE 90.00 TO NODE 92.00 = 405.00 FEET.

 FLOW PROCESS FROM NODE 92.00 TO NODE 92.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN.) = 10.31
 * 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.494
 SUBAREA LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	0.58	0.25	0.100	50

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 0.58 SUBAREA RUNOFF(CFS) = 0.77
 EFFECTIVE AREA(ACRES) = 1.43 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 1.4 PEAK FLOW RATE(CFS) = 1.89

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=====
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1.4 TC(MIN.) = 10.31
EFFECTIVE AREA(ACRES) = 1.43 AREA-AVERAGED Fm(INCH/HR)= 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.100
PEAK FLOW RATE(CFS) = 1.89
=====

=====
END OF RATIONAL METHOD ANALYSIS

↑

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
 (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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 Ver. 21.0 Release Date: 06/01/2014 License ID 1355

Analysis prepared by:

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 16795 Von Karman
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 Irvine, CA 92606

***** DESCRIPTION OF STUDY *****

* RELATED BRISTOL *
 * 10-YEAR STORM EVENT *
 * PROPOSED CONDITION *

FILE NAME: BRIS2PR.DAT
 TIME/DATE OF STUDY: 12:58 02/01/2023

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

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

USER SPECIFIED STORM EVENT(YEAR) = 10.00
 SPECIFIED MINIMUM PIPE SIZE(INCH) = 8.00
 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
 DATA BANK RAINFALL USED
 ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

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

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

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
 1. Relative Flow-Depth = 0.00 FEET
 as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
 2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)
 *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
 OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
 *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

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+-----+
| AREA 'A' |
|         |
+-----+
  
```

FLOW PROCESS FROM NODE 10.00 TO NODE 11.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 327.00
 ELEVATION DATA: UPSTREAM(FEET) = 38.30 DOWNSTREAM(FEET) = 35.00

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Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.725
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.164
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL	C	1.71	0.25	0.100	69	7.73

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 4.83
 TOTAL AREA(ACRES) = 1.71 PEAK FLOW RATE(CFS) = 4.83

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+-----+
| AREA 'B' |
+-----+
  
```

 FLOW PROCESS FROM NODE 20.00 TO NODE 21.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 =====
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 35.40 DOWNSTREAM(FEET) = 31.40

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.474
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.224
 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	C	2.28	0.25	0.100	69	7.47

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 6.56
 TOTAL AREA(ACRES) = 2.28 PEAK FLOW RATE(CFS) = 6.56

 FLOW PROCESS FROM NODE 21.00 TO NODE 21.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 =====
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION(MIN.) = 7.47
 RAINFALL INTENSITY(INCH/HR) = 3.22
 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 2.28
 TOTAL STREAM AREA(ACRES) = 2.28
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 6.56

 FLOW PROCESS FROM NODE 22.00 TO NODE 23.00 IS CODE = 21

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

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INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 35.20 DOWNSTREAM(FEET) = 33.60

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.978
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.903
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS GROUP	SOIL (ACRES)	AREA	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL	C	0.98	0.25	0.100	69	8.98	

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 2.54
 TOTAL AREA(ACRES) = 0.98 PEAK FLOW RATE(CFS) = 2.54

 FLOW PROCESS FROM NODE 23.00 TO NODE 21.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
 =====
 ELEVATION DATA: UPSTREAM(FEET) = 28.50 DOWNSTREAM(FEET) = 27.40
 FLOW LENGTH(FEET) = 351.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 15.0 INCH PIPE IS 9.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 3.06
 ESTIMATED PIPE DIAMETER(INCH) = 15.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 2.54
 PIPE TRAVEL TIME(MIN.) = 1.91 Tc(MIN.) = 10.89
 LONGEST FLOWPATH FROM NODE 22.00 TO NODE 21.00 = 681.00 FEET.

 FLOW PROCESS FROM NODE 21.00 TO NODE 21.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
 =====
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 10.89
 RAINFALL INTENSITY(INCH/HR) = 2.60
 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 0.98
 TOTAL STREAM AREA(ACRES) = 0.98
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 2.54

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6.56	7.47	3.224	0.25(0.03)	0.10	2.3	20.00
2	2.54	10.89	2.599	0.25(0.03)	0.10	1.0	22.00

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	8.73	7.47	3.224	0.25(0.03)	0.10	3.0	20.00
2	7.82	10.89	2.599	0.25(0.03)	0.10	3.3	22.00

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COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 8.73 Tc(MIN.) = 7.47
 EFFECTIVE AREA(ACRES) = 2.95 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 3.3
 LONGEST FLOWPATH FROM NODE 22.00 TO NODE 21.00 = 681.00 FEET.

FLOW PROCESS FROM NODE 21.00 TO NODE 21.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN.) = 7.47
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.224
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	C	1.09	0.25	0.850	69

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.850
 SUBAREA AREA(ACRES) = 1.09 SUBAREA RUNOFF(CFS) = 2.95
 EFFECTIVE AREA(ACRES) = 4.04 AREA-AVERAGED Fm(INCH/HR) = 0.08
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.30
 TOTAL AREA(ACRES) = 4.3 PEAK FLOW RATE(CFS) = 11.46

FLOW PROCESS FROM NODE 21.00 TO NODE 24.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 27.40 DOWNSTREAM(FEET) = 26.10
 FLOW LENGTH(FEET) = 442.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 24.0 INCH PIPE IS 19.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 4.22
 ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 11.46
 PIPE TRAVEL TIME(MIN.) = 1.74 Tc(MIN.) = 9.22
 LONGEST FLOWPATH FROM NODE 22.00 TO NODE 24.00 = 1123.00 FEET.

FLOW PROCESS FROM NODE 24.00 TO NODE 24.00 IS CODE = 10

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

=====

FLOW PROCESS FROM NODE 25.00 TO NODE 26.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 316.00
 ELEVATION DATA: UPSTREAM(FEET) = 36.70 DOWNSTREAM(FEET) = 33.50

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.615
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.190
 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	C	1.26	0.25	0.100	69	7.61

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SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 3.59
 TOTAL AREA(ACRES) = 1.26 PEAK FLOW RATE(CFS) = 3.59

 FLOW PROCESS FROM NODE 26.00 TO NODE 27.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 30.30 DOWNSTREAM(FEET) = 29.20
 FLOW LENGTH(FEET) = 373.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 18.0 INCH PIPE IS 10.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 3.27
 ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 3.59
 PIPE TRAVEL TIME(MIN.) = 1.90 Tc(MIN.) = 9.51
 LONGEST FLOWPATH FROM NODE 25.00 TO NODE 27.00 = 689.00 FEET.

 FLOW PROCESS FROM NODE 27.00 TO NODE 27.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN.) = 9.51
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.808
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	1.06	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 1.06 SUBAREA RUNOFF(CFS) = 2.65
 EFFECTIVE AREA(ACRES) = 2.32 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 2.3 PEAK FLOW RATE(CFS) = 5.81

 FLOW PROCESS FROM NODE 27.00 TO NODE 28.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 29.20 DOWNSTREAM(FEET) = 28.00
 FLOW LENGTH(FEET) = 258.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 4.32
 ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 5.81
 PIPE TRAVEL TIME(MIN.) = 1.00 Tc(MIN.) = 10.51
 LONGEST FLOWPATH FROM NODE 25.00 TO NODE 28.00 = 947.00 FEET.

 FLOW PROCESS FROM NODE 28.00 TO NODE 28.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION(MIN.) = 10.51
 RAINFALL INTENSITY(INCH/HR) = 2.65

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AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 2.32
 TOTAL STREAM AREA(ACRES) = 2.32
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 5.81

FLOW PROCESS FROM NODE 29.00 TO NODE 30.00 IS CODE = 21

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 35.10 DOWNSTREAM(FEET) = 32.90

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.424
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.011
 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	C	1.41	0.25	0.100	69	8.42

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 3.79
 TOTAL AREA(ACRES) = 1.41 PEAK FLOW RATE(CFS) = 3.79

FLOW PROCESS FROM NODE 30.00 TO NODE 31.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 32.90 DOWNSTREAM ELEVATION(FEET) = 32.10
 STREET LENGTH(FEET) = 158.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 30.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.018
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.018

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.57
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.48
 HALFSTREET FLOOD WIDTH(FEET) = 18.01
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.13
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.03
 STREET FLOW TRAVEL TIME(MIN.) = 1.24 Tc(MIN.) = 9.66
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.783

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	2.24	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 2.24 SUBAREA RUNOFF(CFS) = 5.56

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 EFFECTIVE AREA(ACRES) = 3.65 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 3.7 PEAK FLOW RATE(CFS) = 9.06

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.53 HALFSTREET FLOOD WIDTH(FEET) = 20.43
 FLOW VELOCITY(FEET/SEC.) = 2.31 DEPTH*VELOCITY(FT*FT/SEC.) = 1.22
 LONGEST FLOWPATH FROM NODE 29.00 TO NODE 31.00 = 488.00 FEET.

 FLOW PROCESS FROM NODE 31.00 TO NODE 28.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 28.30 DOWNSTREAM(FEET) = 28.00
 FLOW LENGTH(FEET) = 29.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 18.0 INCH PIPE IS 13.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.49
 ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 9.06
 PIPE TRAVEL TIME(MIN.) = 0.07 Tc(MIN.) = 9.74
 LONGEST FLOWPATH FROM NODE 29.00 TO NODE 28.00 = 517.00 FEET.

 FLOW PROCESS FROM NODE 28.00 TO NODE 28.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 9.74
 RAINFALL INTENSITY(INCH/HR) = 2.77
 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 3.65
 TOTAL STREAM AREA(ACRES) = 3.65
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 9.06

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5.81	10.51	2.652	0.25(0.03)	0.10	2.3	25.00
2	9.06	9.74	2.771	0.25(0.03)	0.10	3.7	29.00

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	14.69	9.74	2.771	0.25(0.03)	0.10	5.8	29.00
2	14.48	10.51	2.652	0.25(0.02)	0.10	6.0	25.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) = 14.69 Tc(MIN.) = 9.74
 EFFECTIVE AREA(ACRES) = 5.80 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 6.0
 LONGEST FLOWPATH FROM NODE 25.00 TO NODE 28.00 = 947.00 FEET.

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 FLOW PROCESS FROM NODE 28.00 TO NODE 24.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) =	28.00	DOWNSTREAM(FEET) =	26.10
FLOW LENGTH(FEET) =	82.00	MANNING'S N =	0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS	14.3	INCHES	
PIPE-FLOW VELOCITY(FEET/SEC.) =	9.78		
ESTIMATED PIPE DIAMETER(INCH) =	18.00	NUMBER OF PIPES =	1
PIPE-FLOW(CFS) =	14.69		
PIPE TRAVEL TIME(MIN.) =	0.14	Tc(MIN.) =	9.88
LONGEST FLOWPATH FROM NODE	25.00	TO NODE	24.00 = 1029.00 FEET.

 FLOW PROCESS FROM NODE 24.00 TO NODE 24.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN.) =	9.88				
* 10 YEAR RAINFALL INTENSITY(INCH/HR) =	2.748				
SUBAREA LOSS RATE DATA(AMC II):					
DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
PUBLIC PARK	C	1.10	0.25	0.850	69
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =	0.25				
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =	0.850				
SUBAREA AREA(ACRES) =	1.10	SUBAREA RUNOFF(CFS) =	2.51		
EFFECTIVE AREA(ACRES) =	6.90	AREA-AVERAGED Fm(INCH/HR) =	0.05		
AREA-AVERAGED Fp(INCH/HR) =	0.25	AREA-AVERAGED Ap =	0.22		
TOTAL AREA(ACRES) =	7.1	PEAK FLOW RATE(CFS) =	16.73		

 FLOW PROCESS FROM NODE 24.00 TO NODE 24.00 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	16.73	9.88	2.748	0.25(0.05)	0.22	6.9	29.00
2	16.40	10.65	2.632	0.25(0.05)	0.22	7.1	25.00
LONGEST FLOWPATH FROM NODE 25.00 TO NODE 24.00 = 1029.00 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	11.46	9.22	2.859	0.25(0.08)	0.30	4.0	20.00
2	9.89	12.66	2.384	0.25(0.07)	0.29	4.3	22.00
LONGEST FLOWPATH FROM NODE 22.00 TO NODE 24.00 = 1123.00 FEET.							

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	27.71	9.22	2.859	0.25(0.06)	0.25	10.5	20.00
2	27.88	9.88	2.748	0.25(0.06)	0.25	11.0	29.00
3	27.21	10.65	2.632	0.25(0.06)	0.25	11.2	25.00
4	24.72	12.66	2.384	0.25(0.06)	0.24	11.4	22.00
TOTAL AREA(ACRES) = 11.4							

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COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) = 27.88 Tc(MIN.) = 9.876
 EFFECTIVE AREA(ACRES) = 11.00 AREA-AVERAGED Fm(INCH/HR) = 0.06
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.25
 TOTAL AREA(ACRES) = 11.4
 LONGEST FLOWPATH FROM NODE 22.00 TO NODE 24.00 = 1123.00 FEET.

FLOW PROCESS FROM NODE 24.00 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) = 26.10 DOWNSTREAM(FEET) = 25.20
 FLOW LENGTH(FEET) = 292.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 24.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 5.51
 ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 27.88
 PIPE TRAVEL TIME(MIN.) = 0.88 Tc(MIN.) = 10.76
 LONGEST FLOWPATH FROM NODE 22.00 TO NODE 32.00 = 1415.00 FEET.

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+-----+
| AREA 'C' |
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+-----+
  
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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) = 297.00
 ELEVATION DATA: UPSTREAM(FEET) = 33.80 DOWNSTREAM(FEET) = 33.40

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.120
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.568
 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	C	2.91	0.25	0.100	69	11.12

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 6.66
 TOTAL AREA(ACRES) = 2.91 PEAK FLOW RATE(CFS) = 6.66

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

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

=====

MAINLINE Tc(MIN.) = 11.12
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.568
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	1.19	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

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SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 1.19 SUBAREA RUNOFF(CFS) = 2.72
 EFFECTIVE AREA(ACRES) = 4.10 AREA-AVERAGED Fm(INCH/HR) = 0.02
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 4.1 PEAK FLOW RATE(CFS) = 9.38

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

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

=====

MAINLINE Tc(MIN.) = 11.12
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.568
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL C 1.68 0.25 0.100 69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 1.68 SUBAREA RUNOFF(CFS) = 3.84
 EFFECTIVE AREA(ACRES) = 5.78 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 5.8 PEAK FLOW RATE(CFS) = 13.23

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 | AREA 'D' |
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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) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 35.20 DOWNSTREAM(FEET) = 34.50

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.592
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.640
 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 1.10 0.25 0.100 69 10.59
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 2.59
 TOTAL AREA(ACRES) = 1.10 PEAK FLOW RATE(CFS) = 2.59

+-----+
 | AREA 'E' |
 | |
 | |
 +-----+

FLOW PROCESS FROM NODE 60.00 TO NODE 61.00 IS CODE = 21

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

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=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 39.80 DOWNSTREAM(FEET) = 36.80

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.917
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.120
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 2.23 0.25 0.100 69 7.92
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA RUNOFF(CFS) = 6.21
TOTAL AREA(ACRES) = 2.23 PEAK FLOW RATE(CFS) = 6.21
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*****
FLOW PROCESS FROM NODE 61.00 TO NODE 62.00 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) = 31.50 DOWNSTREAM(FEET) = 30.80
FLOW LENGTH(FEET) = 126.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.6 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.70
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 6.21
PIPE TRAVEL TIME(MIN.) = 0.45 Tc(MIN.) = 8.36
LONGEST FLOWPATH FROM NODE 60.00 TO NODE 62.00 = 456.00 FEET.
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FLOW PROCESS FROM NODE 62.00 TO NODE 62.00 IS CODE = 1
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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
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=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 8.36
RAINFALL INTENSITY(INCH/HR) = 3.02
AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.25
AREA-AVERAGED Ap = 0.10
EFFECTIVE STREAM AREA(ACRES) = 2.23
TOTAL STREAM AREA(ACRES) = 2.23
PEAK FLOW RATE(CFS) AT CONFLUENCE = 6.21
```

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*****
FLOW PROCESS FROM NODE 63.00 TO NODE 64.00 IS CODE = 21
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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
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=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 275.00
ELEVATION DATA: UPSTREAM(FEET) = 36.40 DOWNSTREAM(FEET) = 34.60
```

```
Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.860
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.133
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.)
```

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 COMMERCIAL C 0.84 0.25 0.100 69 7.86
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 2.35
 TOTAL AREA(ACRES) = 0.84 PEAK FLOW RATE(CFS) = 2.35

FLOW PROCESS FROM NODE 64.00 TO NODE 62.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 30.90 DOWNSTREAM(FEET) = 30.80
 FLOW LENGTH(FEET) = 19.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 12.0 INCH PIPE IS 9.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 3.55
 ESTIMATED PIPE DIAMETER(INCH) = 12.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 2.35
 PIPE TRAVEL TIME(MIN.) = 0.09 Tc(MIN.) = 7.95
 LONGEST FLOWPATH FROM NODE 63.00 TO NODE 62.00 = 294.00 FEET.

FLOW PROCESS FROM NODE 62.00 TO NODE 62.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 7.95
 RAINFALL INTENSITY(INCH/HR) = 3.11
 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 0.84
 TOTAL STREAM AREA(ACRES) = 0.84
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 2.35

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6.21	8.36	3.023	0.25(0.03)	0.10	2.2	60.00
2	2.35	7.95	3.112	0.25(0.03)	0.10	0.8	63.00

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	8.43	7.95	3.112	0.25(0.03)	0.10	3.0	63.00
2	8.49	8.36	3.023	0.25(0.03)	0.10	3.1	60.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) = 8.49 Tc(MIN.) = 8.36
 EFFECTIVE AREA(ACRES) = 3.07 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 3.1
 LONGEST FLOWPATH FROM NODE 60.00 TO NODE 62.00 = 456.00 FEET.

FLOW PROCESS FROM NODE 62.00 TO NODE 65.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 30.80 DOWNSTREAM(FEET) = 30.00
 FLOW LENGTH(FEET) = 251.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 24.0 INCH PIPE IS 14.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 4.18
 ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 8.49
 PIPE TRAVEL TIME(MIN.) = 1.00 Tc(MIN.) = 9.37
 LONGEST FLOWPATH FROM NODE 60.00 TO NODE 65.00 = 707.00 FEET.

 FLOW PROCESS FROM NODE 65.00 TO NODE 65.00 IS CODE = 1

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

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION(MIN.) = 9.37
 RAINFALL INTENSITY(INCH/HR) = 2.83
 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 3.07
 TOTAL STREAM AREA(ACRES) = 3.07
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 8.49

 FLOW PROCESS FROM NODE 63.00 TO NODE 66.00 IS CODE = 21

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 36.40 DOWNSTREAM(FEET) = 34.40

 $T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.586
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978
 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	C	0.64	0.25	0.100	69	8.59

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 1.70
 TOTAL AREA(ACRES) = 0.64 PEAK FLOW RATE(CFS) = 1.70

 FLOW PROCESS FROM NODE 66.00 TO NODE 67.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 34.40 DOWNSTREAM ELEVATION(FEET) = 33.80
 STREET LENGTH(FEET) = 110.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 30.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.018

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OUTSIDE STREET CROSSFALL(DECIMAL) = 0.018

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.46
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.40
 HALFSTREET FLOOD WIDTH(FEET) = 13.55
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.89
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.76
 STREET FLOW TRAVEL TIME(MIN.) = 0.97 Tc(MIN.) = 9.56
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.801

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	1.41	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 1.41 SUBAREA RUNOFF(CFS) = 3.52
 EFFECTIVE AREA(ACRES) = 2.05 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 2.0 PEAK FLOW RATE(CFS) = 5.12

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.45 HALFSTREET FLOOD WIDTH(FEET) = 15.98
 FLOW VELOCITY(FEET/SEC.) = 2.07 DEPTH*VELOCITY(FT*FT/SEC.) = 0.93
 LONGEST FLOWPATH FROM NODE 63.00 TO NODE 67.00 = 440.00 FEET.

FLOW PROCESS FROM NODE 67.00 TO NODE 65.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 30.10 DOWNSTREAM(FEET) = 30.00
 FLOW LENGTH(FEET) = 12.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 15.0 INCH PIPE IS 11.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 5.17
 ESTIMATED PIPE DIAMETER(INCH) = 15.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 5.12
 PIPE TRAVEL TIME(MIN.) = 0.04 Tc(MIN.) = 9.60
 LONGEST FLOWPATH FROM NODE 63.00 TO NODE 65.00 = 452.00 FEET.

FLOW PROCESS FROM NODE 65.00 TO NODE 65.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 9.60
 RAINFALL INTENSITY(INCH/HR) = 2.79
 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 2.05
 TOTAL STREAM AREA(ACRES) = 2.05
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 5.12

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** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8.43	8.99	2.901	0.25(0.03)	0.10	3.0	63.00
1	8.49	9.37	2.833	0.25(0.03)	0.10	3.1	60.00
2	5.12	9.60	2.794	0.25(0.03)	0.10	2.0	63.00

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	13.41	8.99	2.901	0.25(0.03)	0.10	4.9	63.00
2	13.56	9.37	2.833	0.25(0.03)	0.10	5.1	60.00
3	13.50	9.60	2.794	0.25(0.03)	0.10	5.1	63.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) = 13.56 Tc(MIN.) = 9.37
 EFFECTIVE AREA(ACRES) = 5.07 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 5.1
 LONGEST FLOWPATH FROM NODE 60.00 TO NODE 65.00 = 707.00 FEET.

 FLOW PROCESS FROM NODE 65.00 TO NODE 68.00 IS CODE = 31

 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
 =====
 ELEVATION DATA: UPSTREAM(FEET) = 30.00 DOWNSTREAM(FEET) = 27.60
 FLOW LENGTH(FEET) = 189.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 21.0 INCH PIPE IS 14.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 7.82
 ESTIMATED PIPE DIAMETER(INCH) = 21.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 13.56
 PIPE TRAVEL TIME(MIN.) = 0.40 Tc(MIN.) = 9.77
 LONGEST FLOWPATH FROM NODE 60.00 TO NODE 68.00 = 896.00 FEET.

+-----+
 | AREA 'F' |
 | |
 | |
 +-----+

 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) = 276.00
 ELEVATION DATA: UPSTREAM(FEET) = 35.40 DOWNSTREAM(FEET) = 34.20

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.542
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.987
 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 1.72 0.25 0.100 69 8.54

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SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 4.58
 TOTAL AREA(ACRES) = 1.72 PEAK FLOW RATE(CFS) = 4.58

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

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

=====

MAINLINE Tc(MIN.) = 8.54
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.987
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	0.82	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 0.82 SUBAREA RUNOFF(CFS) = 2.19
 EFFECTIVE AREA(ACRES) = 2.54 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 2.5 PEAK FLOW RATE(CFS) = 6.77

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

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

=====

MAINLINE Tc(MIN.) = 8.54
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.987
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	1.53	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 1.53 SUBAREA RUNOFF(CFS) = 4.08
 EFFECTIVE AREA(ACRES) = 4.07 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 4.1 PEAK FLOW RATE(CFS) = 10.85

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) = 30.30 DOWNSTREAM(FEET) = 29.20
 FLOW LENGTH(FEET) = 426.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 24.0 INCH PIPE IS 19.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 3.96
 ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 10.85
 PIPE TRAVEL TIME(MIN.) = 1.79 Tc(MIN.) = 10.34
 LONGEST FLOWPATH FROM NODE 70.00 TO NODE 72.00 = 702.00 FEET.

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

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

=====

TOTAL NUMBER OF STREAMS = 3

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CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 10.34
 RAINFALL INTENSITY(INCH/HR) = 2.68
 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 4.07
 TOTAL STREAM AREA(ACRES) = 4.07
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 10.85

FLOW PROCESS FROM NODE 73.00 TO NODE 74.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 35.50 DOWNSTREAM(FEET) = 33.50

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.167
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.703
 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.)
CONDOMINIUMS	C	1.24	0.25	0.350	69	10.17

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
 SUBAREA RUNOFF(CFS) = 2.92
 TOTAL AREA(ACRES) = 1.24 PEAK FLOW RATE(CFS) = 2.92

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

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

=====

MAINLINE Tc(MIN.) = 10.17
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.703
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	0.45	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 0.45 SUBAREA RUNOFF(CFS) = 1.08
 EFFECTIVE AREA(ACRES) = 1.69 AREA-AVERAGED Fm(INCH/HR) = 0.07
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.28
 TOTAL AREA(ACRES) = 1.7 PEAK FLOW RATE(CFS) = 4.00

FLOW PROCESS FROM NODE 74.00 TO NODE 75.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 33.50 DOWNSTREAM ELEVATION(FEET) = 33.30
 STREET LENGTH(FEET) = 51.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 30.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.018
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.018

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SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.97
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.46
 HALFSTREET FLOOD WIDTH(FEET) = 16.91
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.81
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.84
 STREET FLOW TRAVEL TIME(MIN.) = 0.47 Tc(MIN.) = 10.64
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.634

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
CONDOMINIUMS	C	0.84	0.25	0.350	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
 SUBAREA AREA(ACRES) = 0.84 SUBAREA RUNOFF(CFS) = 1.93
 EFFECTIVE AREA(ACRES) = 2.53 AREA-AVERAGED Fm(INCH/HR) = 0.08
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.31
 TOTAL AREA(ACRES) = 2.5 PEAK FLOW RATE(CFS) = 5.82

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 18.01
 FLOW VELOCITY(FEET/SEC.) = 1.88 DEPTH*VELOCITY(FT*FT/SEC.) = 0.91
 LONGEST FLOWPATH FROM NODE 73.00 TO NODE 75.00 = 381.00 FEET.

FLOW PROCESS FROM NODE 75.00 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) = 29.50 DOWNSTREAM(FEET) = 29.20
 FLOW LENGTH(FEET) = 16.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 15.0 INCH PIPE IS 9.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 7.38
 ESTIMATED PIPE DIAMETER(INCH) = 15.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 5.82
 PIPE TRAVEL TIME(MIN.) = 0.04 Tc(MIN.) = 10.67
 LONGEST FLOWPATH FROM NODE 73.00 TO NODE 72.00 = 397.00 FEET.

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

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

=====

TOTAL NUMBER OF STREAMS = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 10.67
 RAINFALL INTENSITY(INCH/HR) = 2.63
 AREA-AVERAGED Fm(INCH/HR) = 0.08
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.31
 EFFECTIVE STREAM AREA(ACRES) = 2.53
 TOTAL STREAM AREA(ACRES) = 2.53
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 5.82

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FLOW PROCESS FROM NODE 76.00 TO NODE 77.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 37.10 DOWNSTREAM(FEET) = 35.10

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.167
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.703
 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.)
CONDOMINIUMS	C	2.10	0.25	0.350	69	10.17

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
 SUBAREA RUNOFF(CFS) = 4.94
 TOTAL AREA(ACRES) = 2.10 PEAK FLOW RATE(CFS) = 4.94

FLOW PROCESS FROM NODE 77.00 TO NODE 78.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 35.10 DOWNSTREAM ELEVATION(FEET) = 34.30
 STREET LENGTH(FEET) = 119.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 30.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.018
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.018

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.69
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.47
 HALFSTREET FLOOD WIDTH(FEET) = 17.07
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.39
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.12
 STREET FLOW TRAVEL TIME(MIN.) = 0.83 Tc(MIN.) = 11.00
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.584

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
CONDOMINIUMS	C	1.55	0.25	0.350	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
 SUBAREA AREA(ACRES) = 1.55 SUBAREA RUNOFF(CFS) = 3.48
 EFFECTIVE AREA(ACRES) = 3.65 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.35
 TOTAL AREA(ACRES) = 3.6 PEAK FLOW RATE(CFS) = 8.20

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.49 HALFSTREET FLOOD WIDTH(FEET) = 18.55
 FLOW VELOCITY(FEET/SEC.) = 2.51 DEPTH*VELOCITY(FT*FT/SEC.) = 1.24
 LONGEST FLOWPATH FROM NODE 76.00 TO NODE 78.00 = 449.00 FEET.

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FLOW PROCESS FROM NODE 78.00 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) = 29.50 DOWNSTREAM(FEET) = 29.20
 FLOW LENGTH(FEET) = 15.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 15.0 INCH PIPE IS 11.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 8.03
 ESTIMATED PIPE DIAMETER(INCH) = 15.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 8.20
 PIPE TRAVEL TIME(MIN.) = 0.03 Tc(MIN.) = 11.03
 LONGEST FLOWPATH FROM NODE 76.00 TO NODE 72.00 = 464.00 FEET.

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 = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 3 ARE:
 TIME OF CONCENTRATION(MIN.) = 11.03
 RAINFALL INTENSITY(INCH/HR) = 2.58
 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.35
 EFFECTIVE STREAM AREA(ACRES) = 3.65
 TOTAL STREAM AREA(ACRES) = 3.65
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 8.20

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10.85	10.34	2.678	0.25(0.03)	0.10	4.1	70.00
2	5.82	10.67	2.629	0.25(0.08)	0.31	2.5	73.00
3	8.20	11.03	2.580	0.25(0.09)	0.35	3.6	76.00

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24.58	10.34	2.678	0.25(0.06)	0.24	9.9	70.00
2	24.57	10.67	2.629	0.25(0.06)	0.24	10.1	73.00
3	24.36	11.03	2.580	0.25(0.06)	0.24	10.2	76.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) = 24.58 Tc(MIN.) = 10.34
 EFFECTIVE AREA(ACRES) = 9.94 AREA-AVERAGED Fm(INCH/HR) = 0.06
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.24
 TOTAL AREA(ACRES) = 10.2
 LONGEST FLOWPATH FROM NODE 70.00 TO NODE 72.00 = 702.00 FEET.

FLOW PROCESS FROM NODE 72.00 TO NODE 79.00 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) = 29.20 DOWNSTREAM(FEET) = 27.80
FLOW LENGTH(FEET) = 451.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 33.0 INCH PIPE IS 24.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.31
ESTIMATED PIPE DIAMETER(INCH) = 33.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 24.58
PIPE TRAVEL TIME(MIN.) = 1.42 Tc(MIN.) = 11.75
LONGEST FLOWPATH FROM NODE 70.00 TO NODE 79.00 = 1153.00 FEET.

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FLOW PROCESS FROM NODE 79.00 TO NODE 79.00 IS CODE = 1
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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

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TOTAL NUMBER OF STREAMS = 3
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 11.75
RAINFALL INTENSITY(INCH/HR) = 2.49
AREA-AVERAGED Fm(INCH/HR) = 0.06
AREA-AVERAGED Fp(INCH/HR) = 0.25
AREA-AVERAGED Ap = 0.24
EFFECTIVE STREAM AREA(ACRES) = 9.94
TOTAL STREAM AREA(ACRES) = 10.25
PEAK FLOW RATE(CFS) AT CONFLUENCE = 24.58

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FLOW PROCESS FROM NODE 76.00 TO NODE 80.00 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) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 37.10 DOWNSTREAM(FEET) = 35.10

```

```

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.167
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.703
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.)
CONDOMINIUMS           C      1.85    0.25    0.350   69  10.17
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
SUBAREA RUNOFF(CFS) = 4.35
TOTAL AREA(ACRES) = 1.85 PEAK FLOW RATE(CFS) = 4.35

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FLOW PROCESS FROM NODE 80.00 TO NODE 81.00 IS CODE = 62
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>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

```

UPSTREAM ELEVATION(FEET) = 35.10 DOWNSTREAM ELEVATION(FEET) = 33.90
STREET LENGTH(FEET) = 148.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 30.00

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DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.018
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.018

```

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1

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STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.21
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.43
 HALFSTREET FLOOD WIDTH(FEET) = 14.80
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.42
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.03
 STREET FLOW TRAVEL TIME(MIN.) = 1.02 Tc(MIN.) = 11.19
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.559

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
CONDOMINIUMS	C	0.77	0.25	0.350	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
 SUBAREA AREA(ACRES) = 0.77 SUBAREA RUNOFF(CFS) = 1.71
 EFFECTIVE AREA(ACRES) = 2.62 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.35
 TOTAL AREA(ACRES) = 2.6 PEAK FLOW RATE(CFS) = 5.83

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.44 HALFSTREET FLOOD WIDTH(FEET) = 15.51
 FLOW VELOCITY(FEET/SEC.) = 2.49 DEPTH*VELOCITY(FT*FT/SEC.) = 1.09
 LONGEST FLOWPATH FROM NODE 76.00 TO NODE 81.00 = 478.00 FEET.

 FLOW PROCESS FROM NODE 81.00 TO NODE 79.00 IS CODE = 31

 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
 =====
 ELEVATION DATA: UPSTREAM(FEET) = 28.10 DOWNSTREAM(FEET) = 27.80
 FLOW LENGTH(FEET) = 12.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 15.0 INCH PIPE IS 8.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 8.26
 ESTIMATED PIPE DIAMETER(INCH) = 15.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 5.83
 PIPE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 11.21
 LONGEST FLOWPATH FROM NODE 76.00 TO NODE 79.00 = 490.00 FEET.

 FLOW PROCESS FROM NODE 79.00 TO NODE 79.00 IS CODE = 1

 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 =====
 TOTAL NUMBER OF STREAMS = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 11.21
 RAINFALL INTENSITY(INCH/HR) = 2.56
 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.35
 EFFECTIVE STREAM AREA(ACRES) = 2.62
 TOTAL STREAM AREA(ACRES) = 2.62
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 5.83

 FLOW PROCESS FROM NODE 82.00 TO NODE 83.00 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) = 320.00
 ELEVATION DATA: UPSTREAM(FEET) = 36.40 DOWNSTREAM(FEET) = 33.90

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.546
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.803
 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.)
 CONDOMINIUMS C 1.10 0.25 0.350 69 9.55
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
 SUBAREA RUNOFF(CFS) = 2.69
 TOTAL AREA(ACRES) = 1.10 PEAK FLOW RATE(CFS) = 2.69

FLOW PROCESS FROM NODE 83.00 TO NODE 79.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 28.10 DOWNSTREAM(FEET) = 27.80
 FLOW LENGTH(FEET) = 10.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 9.0 INCH PIPE IS 7.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 7.02
 ESTIMATED PIPE DIAMETER(INCH) = 9.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 2.69
 PIPE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 9.57
 LONGEST FLOWPATH FROM NODE 82.00 TO NODE 79.00 = 330.00 FEET.

FLOW PROCESS FROM NODE 79.00 TO NODE 79.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 3 ARE:
 TIME OF CONCENTRATION(MIN.) = 9.57
 RAINFALL INTENSITY(INCH/HR) = 2.80
 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.35
 EFFECTIVE STREAM AREA(ACRES) = 1.10
 TOTAL STREAM AREA(ACRES) = 1.10
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 2.69

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24.58	11.75	2.488	0.25(0.06)	0.24	9.9	70.00
1	24.57	12.09	2.448	0.25(0.06)	0.24	10.1	73.00
1	24.36	12.45	2.407	0.25(0.06)	0.24	10.2	76.00
2	5.83	11.21	2.556	0.25(0.09)	0.35	2.6	76.00
3	2.69	9.57	2.799	0.25(0.09)	0.35	1.1	82.00

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

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** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	30.73	9.57	2.799	0.25(0.07)	0.27	11.4	82.00
2	32.38	11.21	2.556	0.25(0.07)	0.27	13.2	76.00
3	32.63	11.75	2.488	0.25(0.07)	0.27	13.7	70.00
4	32.48	12.09	2.448	0.25(0.07)	0.27	13.9	73.00
5	32.14	12.45	2.407	0.25(0.07)	0.27	14.0	76.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 32.63 Tc(MIN.) = 11.75
 EFFECTIVE AREA(ACRES) = 13.66 AREA-AVERAGED Fm(INCH/HR) = 0.07
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.27
 TOTAL AREA(ACRES) = 14.0
 LONGEST FLOWPATH FROM NODE 70.00 TO NODE 79.00 = 1153.00 FEET.

 FLOW PROCESS FROM NODE 79.00 TO NODE 84.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 27.80 DOWNSTREAM(FEET) = 27.40
 FLOW LENGTH(FEET) = 144.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 28.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 5.38
 ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 32.63
 PIPE TRAVEL TIME(MIN.) = 0.45 Tc(MIN.) = 12.20
 LONGEST FLOWPATH FROM NODE 70.00 TO NODE 84.00 = 1297.00 FEET.

 FLOW PROCESS FROM NODE 84.00 TO NODE 84.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN.) = 12.20
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.435
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	0.62	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 0.62 SUBAREA RUNOFF(CFS) = 1.34
 EFFECTIVE AREA(ACRES) = 14.28 AREA-AVERAGED Fm(INCH/HR) = 0.07
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.26
 TOTAL AREA(ACRES) = 14.6 PEAK FLOW RATE(CFS) = 32.63
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 84.00 TO NODE 85.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 27.40 DOWNSTREAM(FEET) = 27.30
 FLOW LENGTH(FEET) = 26.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 25.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.21
 ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 32.63

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 PIPE TRAVEL TIME(MIN.) = 0.07 Tc(MIN.) = 12.27
 LONGEST FLOWPATH FROM NODE 70.00 TO NODE 85.00 = 1323.00 FEET.

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+-----+
| AREA 'G' |
+-----+
  
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 FLOW PROCESS FROM NODE 90.00 TO NODE 91.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 253.00
 ELEVATION DATA: UPSTREAM(FEET) = 37.50 DOWNSTREAM(FEET) = 37.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.659
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.784
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL	C	0.85	0.25	0.100	69	9.66

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 2.11
 TOTAL AREA(ACRES) = 0.85 PEAK FLOW RATE(CFS) = 2.11

 FLOW PROCESS FROM NODE 91.00 TO NODE 92.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 32.50 DOWNSTREAM(FEET) = 31.00
 FLOW LENGTH(FEET) = 152.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 12.0 INCH PIPE IS 6.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 4.52
 ESTIMATED PIPE DIAMETER(INCH) = 12.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 2.11
 PIPE TRAVEL TIME(MIN.) = 0.56 Tc(MIN.) = 10.22
 LONGEST FLOWPATH FROM NODE 90.00 TO NODE 92.00 = 405.00 FEET.

 FLOW PROCESS FROM NODE 92.00 TO NODE 92.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN.) = 10.22
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.695
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	0.58	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 0.58 SUBAREA RUNOFF(CFS) = 1.39
 EFFECTIVE AREA(ACRES) = 1.43 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 1.4 PEAK FLOW RATE(CFS) = 3.44

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=====
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1.4 TC(MIN.) = 10.22
EFFECTIVE AREA(ACRES) = 1.43 AREA-AVERAGED Fm(INCH/HR)= 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.100
PEAK FLOW RATE(CFS) = 3.44
=====

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END OF RATIONAL METHOD ANALYSIS

↑

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
 (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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***** DESCRIPTION OF STUDY *****

* RELATED BRISTOL *
 * 100-YEAR STORM EVENT *
 * PROPOSED CONDITION *

FILE NAME: BRIS2PR.DAT
 TIME/DATE OF STUDY: 09:12 02/02/2023

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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

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

USER SPECIFIED STORM EVENT(YEAR) = 100.00
 SPECIFIED MINIMUM PIPE SIZE(INCH) = 8.00
 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
 DATA BANK RAINFALL USED
 ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD

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

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

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
 1. Relative Flow-Depth = 0.00 FEET
 as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
 2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)
 *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
 OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
 *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

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+-----+
| AREA 'A' |
|         |
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FLOW PROCESS FROM NODE 10.00 TO NODE 11.00 IS CODE = 21

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

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INITIAL SUBAREA FLOW-LENGTH(FEET) = 327.00
 ELEVATION DATA: UPSTREAM(FEET) = 38.30 DOWNSTREAM(FEET) = 35.00

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Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.725
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.822
 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	C	1.71	0.25	0.100	86	7.73

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 7.38
 TOTAL AREA(ACRES) = 1.71 PEAK FLOW RATE(CFS) = 7.38

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+-----+
| AREA 'B' |
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 FLOW PROCESS FROM NODE 20.00 TO NODE 21.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 35.40 DOWNSTREAM(FEET) = 31.40

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.474
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.914
 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	C	2.28	0.25	0.100	86	7.47

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 10.03
 TOTAL AREA(ACRES) = 2.28 PEAK FLOW RATE(CFS) = 10.03

 FLOW PROCESS FROM NODE 21.00 TO NODE 21.00 IS CODE = 1

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

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TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION(MIN.) = 7.47
 RAINFALL INTENSITY(INCH/HR) = 4.91
 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 2.28
 TOTAL STREAM AREA(ACRES) = 2.28
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 10.03

 FLOW PROCESS FROM NODE 22.00 TO NODE 23.00 IS CODE = 21

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

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INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 35.20 DOWNSTREAM(FEET) = 33.60

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.978
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.424
 SUBAREA Tc AND LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS GROUP	SOIL AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL	C	0.98	0.25	0.100	86	8.98

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 3.88
 TOTAL AREA(ACRES) = 0.98 PEAK FLOW RATE(CFS) = 3.88

 FLOW PROCESS FROM NODE 23.00 TO NODE 21.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 28.50 DOWNSTREAM(FEET) = 27.40
 FLOW LENGTH(FEET) = 351.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 18.0 INCH PIPE IS 11.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 3.41
 ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 3.88
 PIPE TRAVEL TIME(MIN.) = 1.71 Tc(MIN.) = 10.69
 LONGEST FLOWPATH FROM NODE 22.00 TO NODE 21.00 = 681.00 FEET.

 FLOW PROCESS FROM NODE 21.00 TO NODE 21.00 IS CODE = 1

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

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TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 10.69
 RAINFALL INTENSITY(INCH/HR) = 4.00
 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 0.98
 TOTAL STREAM AREA(ACRES) = 0.98
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 3.88

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10.03	7.47	4.914	0.25(0.03)	0.10	2.3	20.00
2	3.88	10.69	4.003	0.25(0.03)	0.10	1.0	22.00

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	13.37	7.47	4.914	0.25(0.03)	0.10	3.0	20.00
2	12.04	10.69	4.003	0.25(0.03)	0.10	3.3	22.00

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COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 13.37 Tc(MIN.) = 7.47
 EFFECTIVE AREA(ACRES) = 2.97 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 3.3
 LONGEST FLOWPATH FROM NODE 22.00 TO NODE 21.00 = 681.00 FEET.

 FLOW PROCESS FROM NODE 21.00 TO NODE 21.00 IS CODE = 81

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

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MAINLINE Tc(MIN.) = 7.47
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.914
 SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	C	1.09	0.25	0.850	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.850
 SUBAREA AREA(ACRES) = 1.09 SUBAREA RUNOFF(CFS) = 4.61
 EFFECTIVE AREA(ACRES) = 4.06 AREA-AVERAGED Fm(INCH/HR) = 0.08
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.30
 TOTAL AREA(ACRES) = 4.3 PEAK FLOW RATE(CFS) = 17.66

 FLOW PROCESS FROM NODE 21.00 TO NODE 24.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 27.40 DOWNSTREAM(FEET) = 26.10
 FLOW LENGTH(FEET) = 442.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 30.0 INCH PIPE IS 21.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 4.81
 ESTIMATED PIPE DIAMETER(INCH) = 30.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 17.66
 PIPE TRAVEL TIME(MIN.) = 1.53 Tc(MIN.) = 9.00
 LONGEST FLOWPATH FROM NODE 22.00 TO NODE 24.00 = 1123.00 FEET.

 FLOW PROCESS FROM NODE 24.00 TO NODE 24.00 IS CODE = 10

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

 FLOW PROCESS FROM NODE 25.00 TO NODE 26.00 IS CODE = 21

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

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INITIAL SUBAREA FLOW-LENGTH(FEET) = 316.00
 ELEVATION DATA: UPSTREAM(FEET) = 36.70 DOWNSTREAM(FEET) = 33.50

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.615
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.862
 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	C	1.26	0.25	0.100	86	7.61

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SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 5.49
 TOTAL AREA(ACRES) = 1.26 PEAK FLOW RATE(CFS) = 5.49

FLOW PROCESS FROM NODE 26.00 TO NODE 27.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 30.30 DOWNSTREAM(FEET) = 29.20
 FLOW LENGTH(FEET) = 373.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 21.0 INCH PIPE IS 12.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 3.64
 ESTIMATED PIPE DIAMETER(INCH) = 21.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 5.49
 PIPE TRAVEL TIME(MIN.) = 1.71 Tc(MIN.) = 9.32
 LONGEST FLOWPATH FROM NODE 25.00 TO NODE 27.00 = 689.00 FEET.

FLOW PROCESS FROM NODE 27.00 TO NODE 27.00 IS CODE = 81

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

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MAINLINE Tc(MIN.) = 9.32
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.330
 SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	1.06	0.25	0.100	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 1.06 SUBAREA RUNOFF(CFS) = 4.11
 EFFECTIVE AREA(ACRES) = 2.32 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 2.3 PEAK FLOW RATE(CFS) = 8.99

FLOW PROCESS FROM NODE 27.00 TO NODE 28.00 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) = 29.20 DOWNSTREAM(FEET) = 28.00
 FLOW LENGTH(FEET) = 258.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 21.0 INCH PIPE IS 15.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 4.81
 ESTIMATED PIPE DIAMETER(INCH) = 21.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 8.99
 PIPE TRAVEL TIME(MIN.) = 0.89 Tc(MIN.) = 10.22
 LONGEST FLOWPATH FROM NODE 25.00 TO NODE 28.00 = 947.00 FEET.

FLOW PROCESS FROM NODE 28.00 TO NODE 28.00 IS CODE = 1

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

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TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION(MIN.) = 10.22
 RAINFALL INTENSITY(INCH/HR) = 4.11

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AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 2.32
 TOTAL STREAM AREA(ACRES) = 2.32
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 8.99

FLOW PROCESS FROM NODE 29.00 TO NODE 30.00 IS CODE = 21

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

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INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 35.10 DOWNSTREAM(FEET) = 32.90

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.424
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.589
 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	C	1.41	0.25	0.100	86	8.42

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 5.79
 TOTAL AREA(ACRES) = 1.41 PEAK FLOW RATE(CFS) = 5.79

FLOW PROCESS FROM NODE 30.00 TO NODE 31.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

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UPSTREAM ELEVATION(FEET) = 32.90 DOWNSTREAM ELEVATION(FEET) = 32.10
 STREET LENGTH(FEET) = 158.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 30.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.018
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.018

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.08
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.54
 HALFSTREET FLOOD WIDTH(FEET) = 21.37
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.36
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.28
 STREET FLOW TRAVEL TIME(MIN.) = 1.12 Tc(MIN.) = 9.54
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.273
 SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	2.24	0.25	0.100	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 2.24 SUBAREA RUNOFF(CFS) = 8.56

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 EFFECTIVE AREA(ACRES) = 3.65 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 3.7 PEAK FLOW RATE(CFS) = 13.95

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.60 HALFSTREET FLOOD WIDTH(FEET) = 24.26
 FLOW VELOCITY(FEET/SEC.) = 2.56 DEPTH*VELOCITY(FT*FT/SEC.) = 1.53
 LONGEST FLOWPATH FROM NODE 29.00 TO NODE 31.00 = 488.00 FEET.

 FLOW PROCESS FROM NODE 31.00 TO NODE 28.00 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) = 28.30 DOWNSTREAM(FEET) = 28.00
 FLOW LENGTH(FEET) = 29.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 21.0 INCH PIPE IS 15.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 7.20
 ESTIMATED PIPE DIAMETER(INCH) = 21.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 13.95
 PIPE TRAVEL TIME(MIN.) = 0.07 Tc(MIN.) = 9.61
 LONGEST FLOWPATH FROM NODE 29.00 TO NODE 28.00 = 517.00 FEET.

 FLOW PROCESS FROM NODE 28.00 TO NODE 28.00 IS CODE = 1

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

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TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 9.61
 RAINFALL INTENSITY(INCH/HR) = 4.26
 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 3.65
 TOTAL STREAM AREA(ACRES) = 3.65
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 13.95

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8.99	10.22	4.108	0.25(0.03)	0.10	2.3	25.00
2	13.95	9.61	4.256	0.25(0.03)	0.10	3.7	29.00

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	22.71	9.61	4.256	0.25(0.03)	0.10	5.8	29.00
2	22.46	10.22	4.108	0.25(0.02)	0.10	6.0	25.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) = 22.71 Tc(MIN.) = 9.61
 EFFECTIVE AREA(ACRES) = 5.83 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 6.0
 LONGEST FLOWPATH FROM NODE 25.00 TO NODE 28.00 = 947.00 FEET.

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 FLOW PROCESS FROM NODE 28.00 TO NODE 24.00 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) = 28.00 DOWNSTREAM(FEET) = 26.10
 FLOW LENGTH(FEET) = 82.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 21.0 INCH PIPE IS 17.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 10.84
 ESTIMATED PIPE DIAMETER(INCH) = 21.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 22.71
 PIPE TRAVEL TIME(MIN.) = 0.13 Tc(MIN.) = 9.73
 LONGEST FLOWPATH FROM NODE 25.00 TO NODE 24.00 = 1029.00 FEET.

 FLOW PROCESS FROM NODE 24.00 TO NODE 24.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN.) = 9.73
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.224
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 PUBLIC PARK C 1.10 0.25 0.850 86
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.850
 SUBAREA AREA(ACRES) = 1.10 SUBAREA RUNOFF(CFS) = 3.97
 EFFECTIVE AREA(ACRES) = 6.93 AREA-AVERAGED Fm(INCH/HR) = 0.05
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.22
 TOTAL AREA(ACRES) = 7.1 PEAK FLOW RATE(CFS) = 26.01

 FLOW PROCESS FROM NODE 24.00 TO NODE 24.00 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	26.01	9.73	4.224	0.25(0.05)	0.22	6.9	29.00
2	25.61	10.34	4.080	0.25(0.05)	0.22	7.1	25.00

LONGEST FLOWPATH FROM NODE 25.00 TO NODE 24.00 = 1029.00 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	17.66	9.00	4.417	0.25(0.08)	0.30	4.1	20.00
2	15.39	12.31	3.693	0.25(0.07)	0.29	4.3	22.00

LONGEST FLOWPATH FROM NODE 22.00 TO NODE 24.00 = 1123.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	42.84	9.00	4.417	0.25(0.06)	0.25	10.5	20.00
2	43.17	9.73	4.224	0.25(0.06)	0.25	11.1	29.00
3	42.35	10.34	4.080	0.25(0.06)	0.25	11.2	25.00
4	38.54	12.31	3.693	0.25(0.06)	0.24	11.4	22.00

TOTAL AREA(ACRES) = 11.4

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COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) = 43.17 Tc(MIN.) = 9.733
 EFFECTIVE AREA(ACRES) = 11.05 AREA-AVERAGED Fm(INCH/HR) = 0.06
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.25
 TOTAL AREA(ACRES) = 11.4
 LONGEST FLOWPATH FROM NODE 22.00 TO NODE 24.00 = 1123.00 FEET.

FLOW PROCESS FROM NODE 24.00 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) = 26.10 DOWNSTREAM(FEET) = 25.20
 FLOW LENGTH(FEET) = 292.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 39.0 INCH PIPE IS 31.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 5.98
 ESTIMATED PIPE DIAMETER(INCH) = 39.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 43.17
 PIPE TRAVEL TIME(MIN.) = 0.81 Tc(MIN.) = 10.55
 LONGEST FLOWPATH FROM NODE 22.00 TO NODE 32.00 = 1415.00 FEET.

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| AREA 'C' |
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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) = 297.00
 ELEVATION DATA: UPSTREAM(FEET) = 33.80 DOWNSTREAM(FEET) = 33.40

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.120
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.914
 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	C	2.91	0.25	0.100	86	11.12

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 10.18
 TOTAL AREA(ACRES) = 2.91 PEAK FLOW RATE(CFS) = 10.18

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

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

=====

MAINLINE Tc(MIN.) = 11.12
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.914
 SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	1.19	0.25	0.100	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

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SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 1.19 SUBAREA RUNOFF(CFS) = 4.16
 EFFECTIVE AREA(ACRES) = 4.10 AREA-AVERAGED Fm(INCH/HR) = 0.02
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 4.1 PEAK FLOW RATE(CFS) = 14.35

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

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

=====

MAINLINE Tc(MIN.) = 11.12
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.914
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL C 1.68 0.25 0.100 86
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 1.68 SUBAREA RUNOFF(CFS) = 5.88
 EFFECTIVE AREA(ACRES) = 5.78 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 5.8 PEAK FLOW RATE(CFS) = 20.23

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 | AREA 'D' |
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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) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 35.20 DOWNSTREAM(FEET) = 34.50

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.592
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.024
 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 1.10 0.25 0.100 86 10.59
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 3.96
 TOTAL AREA(ACRES) = 1.10 PEAK FLOW RATE(CFS) = 3.96

+-----+
 | AREA 'E' |
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FLOW PROCESS FROM NODE 60.00 TO NODE 61.00 IS CODE = 21

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

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=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 39.80 DOWNSTREAM(FEET) = 36.80

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.917
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.755
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 2.23 0.25 0.100 86 7.92
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA RUNOFF(CFS) = 9.49
TOTAL AREA(ACRES) = 2.23 PEAK FLOW RATE(CFS) = 9.49
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FLOW PROCESS FROM NODE 61.00 TO NODE 62.00 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) = 31.50 DOWNSTREAM(FEET) = 30.80
FLOW LENGTH(FEET) = 126.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 21.0 INCH PIPE IS 14.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.22
ESTIMATED PIPE DIAMETER(INCH) = 21.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 9.49
PIPE TRAVEL TIME(MIN.) = 0.40 Tc(MIN.) = 8.32
LONGEST FLOWPATH FROM NODE 60.00 TO NODE 62.00 = 456.00 FEET.
```

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*****
FLOW PROCESS FROM NODE 62.00 TO NODE 62.00 IS CODE = 1
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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
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=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 8.32
RAINFALL INTENSITY(INCH/HR) = 4.62
AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.25
AREA-AVERAGED Ap = 0.10
EFFECTIVE STREAM AREA(ACRES) = 2.23
TOTAL STREAM AREA(ACRES) = 2.23
PEAK FLOW RATE(CFS) AT CONFLUENCE = 9.49
```

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*****
FLOW PROCESS FROM NODE 63.00 TO NODE 64.00 IS CODE = 21
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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
```

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=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 275.00
ELEVATION DATA: UPSTREAM(FEET) = 36.40 DOWNSTREAM(FEET) = 34.60
```

```
Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.860
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.775
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.)
```

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 COMMERCIAL C 0.84 0.25 0.100 86 7.86
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 3.59
 TOTAL AREA(ACRES) = 0.84 PEAK FLOW RATE(CFS) = 3.59

 FLOW PROCESS FROM NODE 64.00 TO NODE 62.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 30.90 DOWNSTREAM(FEET) = 30.80
 FLOW LENGTH(FEET) = 19.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 15.0 INCH PIPE IS 10.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 4.03
 ESTIMATED PIPE DIAMETER(INCH) = 15.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 3.59
 PIPE TRAVEL TIME(MIN.) = 0.08 Tc(MIN.) = 7.94
 LONGEST FLOWPATH FROM NODE 63.00 TO NODE 62.00 = 294.00 FEET.

 FLOW PROCESS FROM NODE 62.00 TO NODE 62.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 7.94
 RAINFALL INTENSITY(INCH/HR) = 4.75
 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 0.84
 TOTAL STREAM AREA(ACRES) = 0.84
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 3.59

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9.49	8.32	4.622	0.25(0.03)	0.10	2.2	60.00
2	3.59	7.94	4.747	0.25(0.03)	0.10	0.8	63.00

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	12.90	7.94	4.747	0.25(0.03)	0.10	3.0	63.00
2	12.99	8.32	4.622	0.25(0.03)	0.10	3.1	60.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) = 12.99 Tc(MIN.) = 8.32
 EFFECTIVE AREA(ACRES) = 3.07 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 3.1
 LONGEST FLOWPATH FROM NODE 60.00 TO NODE 62.00 = 456.00 FEET.

 FLOW PROCESS FROM NODE 62.00 TO NODE 65.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 30.80 DOWNSTREAM(FEET) = 30.00
 FLOW LENGTH(FEET) = 251.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 27.0 INCH PIPE IS 18.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 4.62
 ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 12.99
 PIPE TRAVEL TIME(MIN.) = 0.91 Tc(MIN.) = 9.23
 LONGEST FLOWPATH FROM NODE 60.00 TO NODE 65.00 = 707.00 FEET.

FLOW PROCESS FROM NODE 65.00 TO NODE 65.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION(MIN.) = 9.23
 RAINFALL INTENSITY(INCH/HR) = 4.36
 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 3.07
 TOTAL STREAM AREA(ACRES) = 3.07
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 12.99

FLOW PROCESS FROM NODE 63.00 TO NODE 66.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 36.40 DOWNSTREAM(FEET) = 34.40

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.586
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.539
 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	C	0.64	0.25	0.100	86	8.59

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 2.60
 TOTAL AREA(ACRES) = 0.64 PEAK FLOW RATE(CFS) = 2.60

FLOW PROCESS FROM NODE 66.00 TO NODE 67.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 34.40 DOWNSTREAM ELEVATION(FEET) = 33.80
 STREET LENGTH(FEET) = 110.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 30.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.018

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OUTSIDE STREET CROSSFALL(DECIMAL) = 0.018

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.31
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.45
 HALFSTREET FLOOD WIDTH(FEET) = 16.21
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.09
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.94
 STREET FLOW TRAVEL TIME(MIN.) = 0.88 Tc(MIN.) = 9.46
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.293

SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	1.41	0.25	0.100	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 1.41 SUBAREA RUNOFF(CFS) = 5.42
 EFFECTIVE AREA(ACRES) = 2.05 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 2.0 PEAK FLOW RATE(CFS) = 7.87

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.50 HALFSTREET FLOOD WIDTH(FEET) = 19.02
 FLOW VELOCITY(FEET/SEC.) = 2.30 DEPTH*VELOCITY(FT*FT/SEC.) = 1.15
 LONGEST FLOWPATH FROM NODE 63.00 TO NODE 67.00 = 440.00 FEET.

FLOW PROCESS FROM NODE 67.00 TO NODE 65.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 30.10 DOWNSTREAM(FEET) = 30.00
 FLOW LENGTH(FEET) = 12.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 5.79
 ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 7.87
 PIPE TRAVEL TIME(MIN.) = 0.03 Tc(MIN.) = 9.50
 LONGEST FLOWPATH FROM NODE 63.00 TO NODE 65.00 = 452.00 FEET.

FLOW PROCESS FROM NODE 65.00 TO NODE 65.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 9.50
 RAINFALL INTENSITY(INCH/HR) = 4.28
 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 2.05
 TOTAL STREAM AREA(ACRES) = 2.05
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 7.87

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** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12.90	8.85	4.462	0.25(0.03)	0.10	3.0	63.00
1	12.99	9.23	4.356	0.25(0.03)	0.10	3.1	60.00
2	7.87	9.50	4.284	0.25(0.03)	0.10	2.0	63.00

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	20.54	8.85	4.462	0.25(0.03)	0.10	4.9	63.00
2	20.77	9.23	4.356	0.25(0.03)	0.10	5.1	60.00
3	20.65	9.50	4.284	0.25(0.03)	0.10	5.1	63.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) = 20.77 Tc(MIN.) = 9.23
 EFFECTIVE AREA(ACRES) = 5.06 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 5.1
 LONGEST FLOWPATH FROM NODE 60.00 TO NODE 65.00 = 707.00 FEET.

 FLOW PROCESS FROM NODE 65.00 TO NODE 68.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 30.00 DOWNSTREAM(FEET) = 27.60
 FLOW LENGTH(FEET) = 189.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 24.0 INCH PIPE IS 17.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 8.65
 ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 20.77
 PIPE TRAVEL TIME(MIN.) = 0.36 Tc(MIN.) = 9.59
 LONGEST FLOWPATH FROM NODE 60.00 TO NODE 68.00 = 896.00 FEET.

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 | AREA 'F' |
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 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) = 276.00
 ELEVATION DATA: UPSTREAM(FEET) = 35.40 DOWNSTREAM(FEET) = 34.20

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.542
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.552
 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	C	1.72	0.25	0.100	86	8.54

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SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 7.01
 TOTAL AREA(ACRES) = 1.72 PEAK FLOW RATE(CFS) = 7.01

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

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

=====

MAINLINE Tc(MIN.) = 8.54
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.552
 SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	0.82	0.25	0.100	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 0.82 SUBAREA RUNOFF(CFS) = 3.34
 EFFECTIVE AREA(ACRES) = 2.54 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 2.5 PEAK FLOW RATE(CFS) = 10.35

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

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

=====

MAINLINE Tc(MIN.) = 8.54
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.552
 SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	1.53	0.25	0.100	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 1.53 SUBAREA RUNOFF(CFS) = 6.23
 EFFECTIVE AREA(ACRES) = 4.07 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 4.1 PEAK FLOW RATE(CFS) = 16.58

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) = 30.30 DOWNSTREAM(FEET) = 29.20
 FLOW LENGTH(FEET) = 426.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 30.0 INCH PIPE IS 21.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 4.51
 ESTIMATED PIPE DIAMETER(INCH) = 30.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 16.58
 PIPE TRAVEL TIME(MIN.) = 1.57 Tc(MIN.) = 10.12
 LONGEST FLOWPATH FROM NODE 70.00 TO NODE 72.00 = 702.00 FEET.

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

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

=====

TOTAL NUMBER OF STREAMS = 3

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CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 10.12
 RAINFALL INTENSITY(INCH/HR) = 4.13
 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 4.07
 TOTAL STREAM AREA(ACRES) = 4.07
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 16.58

FLOW PROCESS FROM NODE 73.00 TO NODE 74.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 35.50 DOWNSTREAM(FEET) = 33.50

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.167
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.120
 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.)
CONDOMINIUMS	C	1.24	0.25	0.350	86	10.17

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
 SUBAREA RUNOFF(CFS) = 4.50
 TOTAL AREA(ACRES) = 1.24 PEAK FLOW RATE(CFS) = 4.50

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

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

=====

MAINLINE Tc(MIN.) = 10.17
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.120
 SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	0.45	0.25	0.100	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 0.45 SUBAREA RUNOFF(CFS) = 1.66
 EFFECTIVE AREA(ACRES) = 1.69 AREA-AVERAGED Fm(INCH/HR) = 0.07
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.28
 TOTAL AREA(ACRES) = 1.7 PEAK FLOW RATE(CFS) = 6.16

FLOW PROCESS FROM NODE 74.00 TO NODE 75.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 33.50 DOWNSTREAM ELEVATION(FEET) = 33.30
 STREET LENGTH(FEET) = 51.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 30.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.018
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.018

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SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.65
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.52
 HALFSTREET FLOOD WIDTH(FEET) = 20.12
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.01
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.05
 STREET FLOW TRAVEL TIME(MIN.) = 0.42 Tc(MIN.) = 10.59
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.025

SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
CONDOMINIUMS	C	0.84	0.25	0.350	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
 SUBAREA AREA(ACRES) = 0.84 SUBAREA RUNOFF(CFS) = 2.98
 EFFECTIVE AREA(ACRES) = 2.53 AREA-AVERAGED Fm(INCH/HR) = 0.08
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.31
 TOTAL AREA(ACRES) = 2.5 PEAK FLOW RATE(CFS) = 8.99

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.55 HALFSTREET FLOOD WIDTH(FEET) = 21.45
 FLOW VELOCITY(FEET/SEC.) = 2.09 DEPTH*VELOCITY(FT*FT/SEC.) = 1.14
 LONGEST FLOWPATH FROM NODE 73.00 TO NODE 75.00 = 381.00 FEET.

FLOW PROCESS FROM NODE 75.00 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) = 29.50 DOWNSTREAM(FEET) = 29.20
 FLOW LENGTH(FEET) = 16.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 18.0 INCH PIPE IS 10.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 8.24
 ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 8.99
 PIPE TRAVEL TIME(MIN.) = 0.03 Tc(MIN.) = 10.62
 LONGEST FLOWPATH FROM NODE 73.00 TO NODE 72.00 = 397.00 FEET.

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

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

=====

TOTAL NUMBER OF STREAMS = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 10.62
 RAINFALL INTENSITY(INCH/HR) = 4.02
 AREA-AVERAGED Fm(INCH/HR) = 0.08
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.31
 EFFECTIVE STREAM AREA(ACRES) = 2.53
 TOTAL STREAM AREA(ACRES) = 2.53
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 8.99

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FLOW PROCESS FROM NODE 76.00 TO NODE 77.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 37.10 DOWNSTREAM(FEET) = 35.10

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.167
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.120
 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.)
CONDOMINIUMS	C	2.10	0.25	0.350	86	10.17

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
 SUBAREA RUNOFF(CFS) = 7.62
 TOTAL AREA(ACRES) = 2.10 PEAK FLOW RATE(CFS) = 7.62

FLOW PROCESS FROM NODE 77.00 TO NODE 78.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 35.10 DOWNSTREAM ELEVATION(FEET) = 34.30
 STREET LENGTH(FEET) = 119.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 30.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.018
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.018

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.32
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.53
 HALFSTREET FLOOD WIDTH(FEET) = 20.35
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.65
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.39
 STREET FLOW TRAVEL TIME(MIN.) = 0.75 Tc(MIN.) = 10.92
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.956

SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
CONDOMINIUMS	C	1.55	0.25	0.350	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
 SUBAREA AREA(ACRES) = 1.55 SUBAREA RUNOFF(CFS) = 5.40
 EFFECTIVE AREA(ACRES) = 3.65 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.35
 TOTAL AREA(ACRES) = 3.6 PEAK FLOW RATE(CFS) = 12.71

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.56 HALFSTREET FLOOD WIDTH(FEET) = 22.15
 FLOW VELOCITY(FEET/SEC.) = 2.78 DEPTH*VELOCITY(FT*FT/SEC.) = 1.55
 LONGEST FLOWPATH FROM NODE 76.00 TO NODE 78.00 = 449.00 FEET.

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FLOW PROCESS FROM NODE 78.00 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) = 29.50 DOWNSTREAM(FEET) = 29.20
 FLOW LENGTH(FEET) = 15.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 18.0 INCH PIPE IS 13.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 9.03
 ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 12.71
 PIPE TRAVEL TIME(MIN.) = 0.03 Tc(MIN.) = 10.94
 LONGEST FLOWPATH FROM NODE 76.00 TO NODE 72.00 = 464.00 FEET.

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 = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 3 ARE:
 TIME OF CONCENTRATION(MIN.) = 10.94
 RAINFALL INTENSITY(INCH/HR) = 3.95
 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.35
 EFFECTIVE STREAM AREA(ACRES) = 3.65
 TOTAL STREAM AREA(ACRES) = 3.65
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 12.71

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16.58	10.12	4.132	0.25(0.03)	0.10	4.1	70.00
2	8.99	10.62	4.018	0.25(0.08)	0.31	2.5	73.00
3	12.71	10.94	3.950	0.25(0.09)	0.35	3.6	76.00

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	37.69	10.12	4.132	0.25(0.06)	0.24	9.9	70.00
2	37.66	10.62	4.018	0.25(0.06)	0.24	10.1	73.00
3	37.39	10.94	3.950	0.25(0.06)	0.24	10.2	76.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) = 37.69 Tc(MIN.) = 10.12
 EFFECTIVE AREA(ACRES) = 9.85 AREA-AVERAGED Fm(INCH/HR) = 0.06
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.24
 TOTAL AREA(ACRES) = 10.2
 LONGEST FLOWPATH FROM NODE 70.00 TO NODE 72.00 = 702.00 FEET.

FLOW PROCESS FROM NODE 72.00 TO NODE 79.00 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) = 29.20 DOWNSTREAM(FEET) = 27.80
FLOW LENGTH(FEET) = 451.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 39.0 INCH PIPE IS 28.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.92
ESTIMATED PIPE DIAMETER(INCH) = 39.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 37.69
PIPE TRAVEL TIME(MIN.) = 1.27 Tc(MIN.) = 11.39
LONGEST FLOWPATH FROM NODE 70.00 TO NODE 79.00 = 1153.00 FEET.
  
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FLOW PROCESS FROM NODE 79.00 TO NODE 79.00 IS CODE = 1
  
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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  
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TOTAL NUMBER OF STREAMS = 3
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 11.39
RAINFALL INTENSITY(INCH/HR) = 3.86
AREA-AVERAGED Fm(INCH/HR) = 0.06
AREA-AVERAGED Fp(INCH/HR) = 0.25
AREA-AVERAGED Ap = 0.24
EFFECTIVE STREAM AREA(ACRES) = 9.85
TOTAL STREAM AREA(ACRES) = 10.25
PEAK FLOW RATE(CFS) AT CONFLUENCE = 37.69
  
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FLOW PROCESS FROM NODE 76.00 TO NODE 80.00 IS CODE = 21
  
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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
  
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INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 37.10 DOWNSTREAM(FEET) = 35.10
  
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Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.167
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.120
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.)
CONDOMINIUMS         C      1.85    0.25    0.350   86  10.17
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
SUBAREA RUNOFF(CFS) = 6.71
TOTAL AREA(ACRES) = 1.85 PEAK FLOW RATE(CFS) = 6.71
  
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FLOW PROCESS FROM NODE 80.00 TO NODE 81.00 IS CODE = 62
  
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>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<
  
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UPSTREAM ELEVATION(FEET) = 35.10 DOWNSTREAM ELEVATION(FEET) = 33.90
STREET LENGTH(FEET) = 148.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 30.00
  
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DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.018
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.018
  
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SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
  
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STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8.04
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.48
 HALFSTREET FLOOD WIDTH(FEET) = 17.77
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.67
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.28
 STREET FLOW TRAVEL TIME(MIN.) = 0.92 Tc(MIN.) = 11.09
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.919

SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
CONDOMINIUMS	C	0.77	0.25	0.350	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
 SUBAREA AREA(ACRES) = 0.77 SUBAREA RUNOFF(CFS) = 2.66
 EFFECTIVE AREA(ACRES) = 2.62 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.35
 TOTAL AREA(ACRES) = 2.6 PEAK FLOW RATE(CFS) = 9.04

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.50 HALFSTREET FLOOD WIDTH(FEET) = 18.63
 FLOW VELOCITY(FEET/SEC.) = 2.74 DEPTH*VELOCITY(FT*FT/SEC.) = 1.36
 LONGEST FLOWPATH FROM NODE 76.00 TO NODE 81.00 = 478.00 FEET.

FLOW PROCESS FROM NODE 81.00 TO NODE 79.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 28.10 DOWNSTREAM(FEET) = 27.80
 FLOW LENGTH(FEET) = 12.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 15.0 INCH PIPE IS 11.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 8.97
 ESTIMATED PIPE DIAMETER(INCH) = 15.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 9.04
 PIPE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 11.11
 LONGEST FLOWPATH FROM NODE 76.00 TO NODE 79.00 = 490.00 FEET.

FLOW PROCESS FROM NODE 79.00 TO NODE 79.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 11.11
 RAINFALL INTENSITY(INCH/HR) = 3.91
 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.35
 EFFECTIVE STREAM AREA(ACRES) = 2.62
 TOTAL STREAM AREA(ACRES) = 2.62
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 9.04

FLOW PROCESS FROM NODE 82.00 TO NODE 83.00 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) = 320.00
 ELEVATION DATA: UPSTREAM(FEET) = 36.40 DOWNSTREAM(FEET) = 33.90

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.546
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.272
 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.)
 CONDOMINIUMS C 1.10 0.25 0.350 86 9.55
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
 SUBAREA RUNOFF(CFS) = 4.14
 TOTAL AREA(ACRES) = 1.10 PEAK FLOW RATE(CFS) = 4.14

FLOW PROCESS FROM NODE 83.00 TO NODE 79.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 28.10 DOWNSTREAM(FEET) = 27.80
 FLOW LENGTH(FEET) = 10.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 12.0 INCH PIPE IS 7.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 8.08
 ESTIMATED PIPE DIAMETER(INCH) = 12.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 4.14
 PIPE TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 9.57
 LONGEST FLOWPATH FROM NODE 82.00 TO NODE 79.00 = 330.00 FEET.

FLOW PROCESS FROM NODE 79.00 TO NODE 79.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 3 ARE:
 TIME OF CONCENTRATION(MIN.) = 9.57
 RAINFALL INTENSITY(INCH/HR) = 4.27
 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.35
 EFFECTIVE STREAM AREA(ACRES) = 1.10
 TOTAL STREAM AREA(ACRES) = 1.10
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 4.14

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	37.69	11.39	3.861	0.25(0.06)	0.24	9.9	70.00
1	37.66	11.89	3.766	0.25(0.06)	0.24	10.1	73.00
1	37.39	12.21	3.709	0.25(0.06)	0.24	10.2	76.00
2	9.04	11.11	3.915	0.25(0.09)	0.35	2.6	76.00
3	4.14	9.57	4.266	0.25(0.09)	0.35	1.1	82.00

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

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** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	47.68	9.57	4.266	0.25(0.07)	0.27	11.6	82.00
2	50.14	11.11	3.915	0.25(0.07)	0.27	13.3	76.00
3	50.34	11.39	3.861	0.25(0.07)	0.27	13.6	70.00
4	49.99	11.89	3.766	0.25(0.07)	0.27	13.9	73.00
5	49.53	12.21	3.709	0.25(0.07)	0.27	14.0	76.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 50.34 Tc(MIN.) = 11.39
 EFFECTIVE AREA(ACRES) = 13.57 AREA-AVERAGED Fm(INCH/HR) = 0.07
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.27
 TOTAL AREA(ACRES) = 14.0
 LONGEST FLOWPATH FROM NODE 70.00 TO NODE 79.00 = 1153.00 FEET.

 FLOW PROCESS FROM NODE 79.00 TO NODE 84.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 27.80 DOWNSTREAM(FEET) = 27.40
 FLOW LENGTH(FEET) = 144.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 31.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.12
 ESTIMATED PIPE DIAMETER(INCH) = 45.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 50.34
 PIPE TRAVEL TIME(MIN.) = 0.39 Tc(MIN.) = 11.78
 LONGEST FLOWPATH FROM NODE 70.00 TO NODE 84.00 = 1297.00 FEET.

 FLOW PROCESS FROM NODE 84.00 TO NODE 84.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN.) = 11.78
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.787
 SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	0.62	0.25	0.100	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 0.62 SUBAREA RUNOFF(CFS) = 2.10
 EFFECTIVE AREA(ACRES) = 14.19 AREA-AVERAGED Fm(INCH/HR) = 0.06
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.26
 TOTAL AREA(ACRES) = 14.6 PEAK FLOW RATE(CFS) = 50.34
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 FLOW PROCESS FROM NODE 84.00 TO NODE 85.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 27.40 DOWNSTREAM(FEET) = 27.30
 FLOW LENGTH(FEET) = 26.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 42.0 INCH PIPE IS 29.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.91
 ESTIMATED PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 50.34

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 PIPE TRAVEL TIME(MIN.) = 0.06 Tc(MIN.) = 11.84
 LONGEST FLOWPATH FROM NODE 70.00 TO NODE 85.00 = 1323.00 FEET.

```

+-----+
| AREA 'G' |
+-----+
  
```

 FLOW PROCESS FROM NODE 90.00 TO NODE 91.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 253.00
 ELEVATION DATA: UPSTREAM(FEET) = 37.50 DOWNSTREAM(FEET) = 37.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.659
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.243
 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	C	0.85	0.25	0.100	86	9.66

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 3.23
 TOTAL AREA(ACRES) = 0.85 PEAK FLOW RATE(CFS) = 3.23

 FLOW PROCESS FROM NODE 91.00 TO NODE 92.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 32.50 DOWNSTREAM(FEET) = 31.00
 FLOW LENGTH(FEET) = 152.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 12.0 INCH PIPE IS 9.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 4.87
 ESTIMATED PIPE DIAMETER(INCH) = 12.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 3.23
 PIPE TRAVEL TIME(MIN.) = 0.52 Tc(MIN.) = 10.18
 LONGEST FLOWPATH FROM NODE 90.00 TO NODE 92.00 = 405.00 FEET.

 FLOW PROCESS FROM NODE 92.00 TO NODE 92.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN.) = 10.18
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.117
 SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	0.58	0.25	0.100	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 0.58 SUBAREA RUNOFF(CFS) = 2.14
 EFFECTIVE AREA(ACRES) = 1.43 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 1.4 PEAK FLOW RATE(CFS) = 5.27

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=====
END OF STUDY SUMMARY:

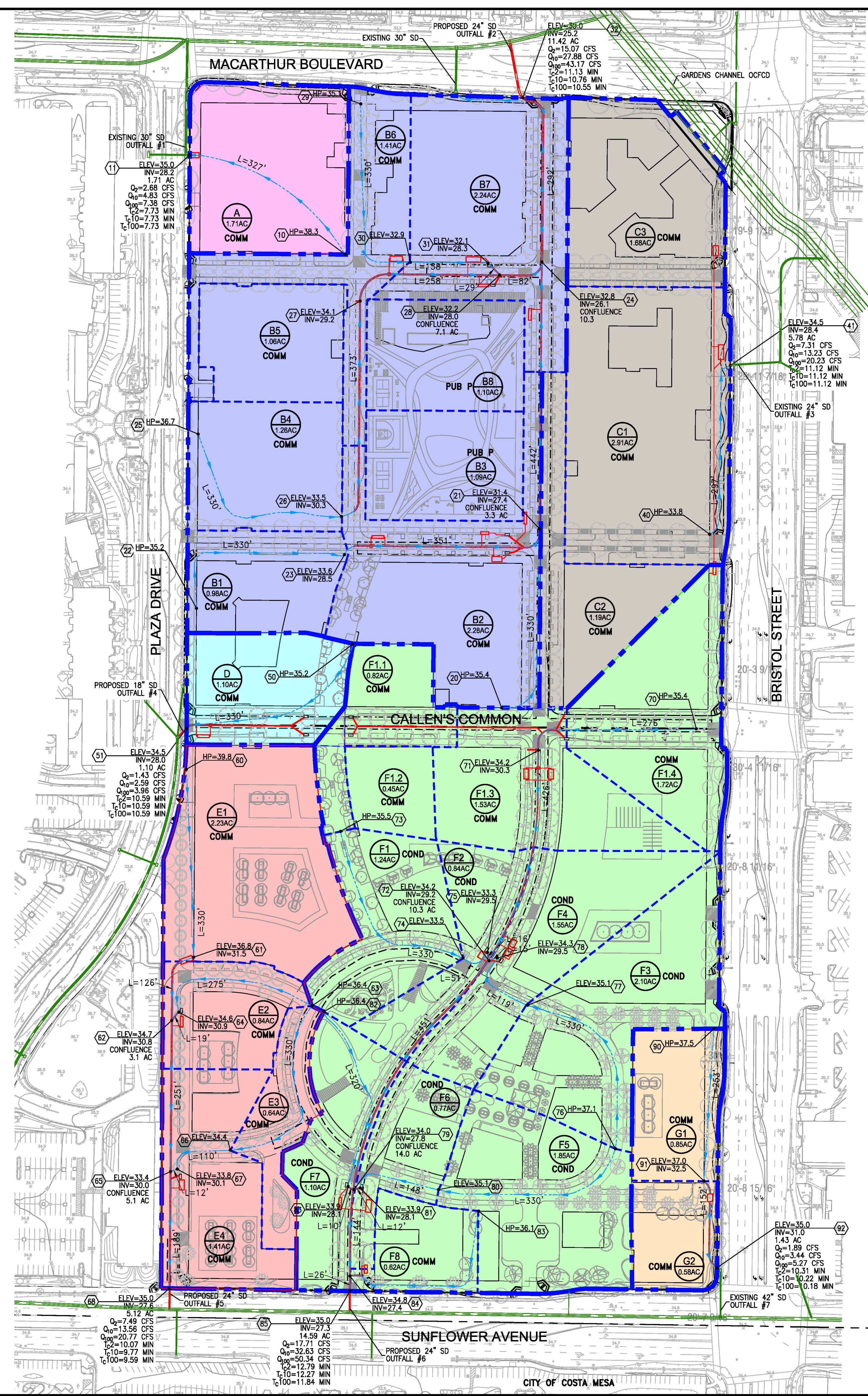
TOTAL AREA(ACRES) = 1.4 TC(MIN.) = 10.18
EFFECTIVE AREA(ACRES) = 1.43 AREA-AVERAGED Fm(INCH/HR)= 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.100
PEAK FLOW RATE(CFS) = 5.27
=====

=====
END OF RATIONAL METHOD ANALYSIS

↑

Appendix 8

Hydrology Map - Proposed Condition



PROPOSED CONDITION SUMMARY TABLE

DRAINAGE AREA	DISCHARGE NODE	Q ₂ (CFS)	Q ₁₀ (CFS)	Q ₁₀₀ (CFS)	AREA (ACRES)	T _{C2} (MIN)	T _{C10} (MIN)	T _{C100} (MIN)
A	11	2.68	4.83	7.38	1.71	7.73	7.73	7.73
B	32	15.07	27.88	43.17	11.42	11.13	10.76	10.55
C	41	7.31	13.23	20.23	5.78	11.12	11.12	11.12
D	51	1.43	2.59	3.96	1.10	10.59	10.59	10.59
E	68	7.49	13.56	20.77	5.12	10.07	9.77	9.59
F	85	17.71	32.63	50.34	14.59	12.79	12.77	11.84
G	92	1.89	3.44	5.27	1.43	10.31	10.22	10.18
TOTAL		53.58	98.16	151.12	41.15			

NOTES

SOIL TYPE C

DRAINAGE PATTERN ACREAGE

NORTH [DRAINAGE AREA A, B, C] - 18.91 AC
SOUTH [DRAINAGE AREA D, E, F, G] - 22.24 AC

ASSESSOR PARCEL NO.

412-131-12, 412-131-13, 412-131-14, 412-131-16,
412-131-17, 412-131-22, 412-131-24, 412-131-25
AND 412-131-26

SITE ADDRESS

3800, 3810 & 3930 S BRISTOL STREET
SANTA ANA, CALIFORNIA

DEVELOPER

RELATED CALIFORNIA RESIDENTIAL, LLC
18201 VON KARMAN AVENUE, SUITE 900
IRVINE, CA 92612
TEL: 949.474.1980
TEL: 949.660.7272

CIVIL ENGINEER

FUSCOE ENGINEERING
16795 VON KARMAN, SUITE 100
IRVINE, CA 92606
TEL: 949.474.1980
FAX: 949.474.5315

ABBREVIATIONS

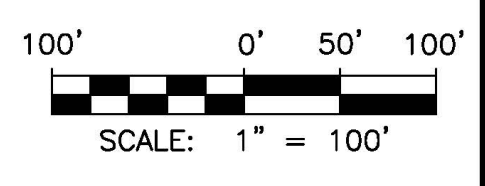
- AC ACRE
- AC-FT ACRE-FOOT
- CFS CUBIC FEET PER SECOND
- COMM COMMERCIAL
- COND CONDOMINIUMS
- COSA CITY OF SANTA ANA
- ELEV ELEVATION
- HP HIGH POINT
- L LENGTH
- MIN MINUTES
- OCFCD ORANGE COUNTY FLOOD CONTROL DISTRICT
- PUB P PUBLIC PARK
- Q₂ FLOW RATE - 2-YEAR STORM
- S SLOPE
- T_c TIME OF CONCENTRATION

LEGEND

- DRAINAGE BOUNDARY
- DRAINAGE SUB-BOUNDARY
- NODE
- TIME OF CONCENTRATION FLOW PATH
- FLOW PATH LENGTH
- DRAINAGE BOUNDARY DESIGNATION AND AREA
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- DRAINAGE AREA A
- DRAINAGE AREA B
- DRAINAGE AREA C
- DRAINAGE AREA D
- DRAINAGE AREA E
- DRAINAGE AREA F
- DRAINAGE AREA G
- CATCH BASIN
- MODULAR WETLAND SYSTEM

Related Bristol Drainage Comparisons

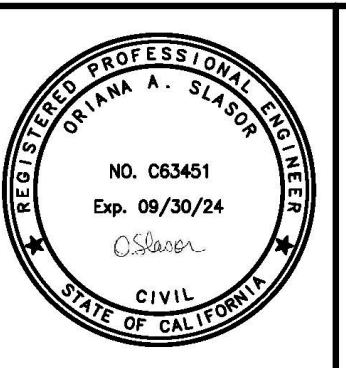
Line	Outfall #	Existing SD	Existing		Proposed		Difference (Proposed - Existing)
			Acreage	Q10 (cfs)	Acreage	Q10 (cfs)	
MacArthur Boulevard	#1	30" lateral to 63" SD (Dwg. No. HF-47-12)					
	#2	30" lateral to 63" SD (Dwg. No. I-36-9)	14.11 ac	35 cfs	13.1 ac	32.7 cfs	-2.3
Bristol Street	#3	24" lateral (Dwg. No. I-13-8)	6.1 ac	17.1 cfs	5.78 ac	13.2 cfs	-3.9
Plaza Drive	#4	36" SD (Dwg. No. HF-47-12)	1.16 ac	4 cfs	1.1 ac	2.6 cfs	-1.4
Sunflower	#5	54" SD (Dwg. No. HF-18-58)	19.78 ac	50.7 cfs	21.1 ac	49.6 cfs	-1.1
	#6						
	#7						
Total			41.15 ac	106.8 cfs	41.15 ac	98.2 cfs	For all lines, the proposed condition Q is less than the existing



Prepared for
(Developer/Applicant):

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PREPARED BY:
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**HYDROLOGY MAP
PROPOSED CONDITION
RELATED BRISTOL
CITY OF SANTA ANA, CALIFORNIA**

PROJECT NO.
622-015
SHEET
1
OF
1

Appendix 9

Unit Hydrograph Volume Calculation Existing Condition

NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)
AND LOW LOSS FRACTION ESTIMATIONS

=====

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Ver. 21.0 Release Date: 06/01/2014 License ID 1355

Analysis prepared by:

Fusco Engineering
16795 Von Karman
Suite 100
Irvine, CA 92606

Problem Descriptions:

BRISTOL COMMONS
2-YEAR HYDROGRAPH
EXISTING CONDITION

=====

*** NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)
AND LOW LOSS FRACTION ESTIMATIONS FOR AMC I:

TOTAL 24-HOUR DURATION RAINFALL DEPTH = 2.05 (inches)

SOIL-COVER TYPE	AREA (Acres)	PERCENT OF PERVIOUS AREA	SCS CURVE NUMBER	LOSS RATE Fp(in./hr.)	YIELD
1	41.15	10.00	69.(AMC II)	0.250	0.801

TOTAL AREA (Acres) = 41.15

AREA-AVERAGED LOSS RATE, \bar{F}_m (in./hr.) = 0.025

AREA-AVERAGED LOW LOSS FRACTION, \bar{Y} = 0.199

=====

SMALL AREA UNIT HYDROGRAPH MODEL

=====

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Ver. 21.0 Release Date: 06/01/2014 License ID 1355

Analysis prepared by:

Fusco Engineering
16795 Von Karman
Suite 100
Irvine, CA 92606

Problem Descriptions:

BRISTOL COMMONS
 2-YEAR STORM EVENT
 EXISTING CONDITION (CALIB COEFF=0.8652)

RATIONAL METHOD CALIBRATION COEFFICIENT = 0.87
 TOTAL CATCHMENT AREA (ACRES) = 41.15
 SOIL-LOSS RATE, Fm, (INCH/HR) = 0.025
 LOW LOSS FRACTION = 0.199
 TIME OF CONCENTRATION (MIN.) = 8.85
 SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
 ORANGE COUNTY "VALLEY" RAINFALL VALUES ARE USED
 RETURN FREQUENCY (YEARS) = 2
 5-MINUTE POINT RAINFALL VALUE (INCHES) = 0.19
 30-MINUTE POINT RAINFALL VALUE (INCHES) = 0.40
 1-HOUR POINT RAINFALL VALUE (INCHES) = 0.53
 3-HOUR POINT RAINFALL VALUE (INCHES) = 0.89
 6-HOUR POINT RAINFALL VALUE (INCHES) = 1.22
 24-HOUR POINT RAINFALL VALUE (INCHES) = 2.05

TOTAL CATCHMENT RUNOFF VOLUME (ACRE-FEET) = 5.14
 TOTAL CATCHMENT SOIL-LOSS VOLUME (ACRE-FEET) = 1.89

TIME (HOURS)	VOLUME (AF)	Q (CFS)	0.	15.0	30.0	45.0	60.0
0.07	0.0000	0.00	Q	.	.	.	.
0.22	0.0056	0.92	Q	.	.	.	.
0.36	0.0168	0.92	Q	.	.	.	.
0.51	0.0280	0.93	Q	.	.	.	.
0.66	0.0394	0.93	Q	.	.	.	.
0.81	0.0507	0.94	Q	.	.	.	.
0.95	0.0622	0.94	Q	.	.	.	.
1.10	0.0737	0.95	Q	.	.	.	.
1.25	0.0853	0.95	Q	.	.	.	.
1.40	0.0970	0.96	Q	.	.	.	.
1.54	0.1088	0.97	Q	.	.	.	.
1.69	0.1206	0.97	Q	.	.	.	.
1.84	0.1325	0.98	Q	.	.	.	.
1.99	0.1444	0.99	Q	.	.	.	.
2.13	0.1565	0.99	Q	.	.	.	.
2.28	0.1686	1.00	Q	.	.	.	.
2.43	0.1808	1.00	Q	.	.	.	.
2.58	0.1931	1.01	Q	.	.	.	.
2.72	0.2055	1.02	Q	.	.	.	.
2.87	0.2180	1.03	Q	.	.	.	.
3.02	0.2305	1.03	Q	.	.	.	.
3.17	0.2432	1.04	Q	.	.	.	.
3.31	0.2559	1.05	Q	.	.	.	.
3.46	0.2687	1.06	Q	.	.	.	.
3.61	0.2816	1.06	Q	.	.	.	.

3.76	0.2947	1.07	Q	.	.	.	.
3.90	0.3078	1.08	Q	.	.	.	.
4.05	0.3210	1.09	Q	.	.	.	.
4.20	0.3343	1.09	Q	.	.	.	.
4.35	0.3477	1.11	Q	.	.	.	.
4.49	0.3612	1.11	Q	.	.	.	.
4.64	0.3749	1.12	Q	.	.	.	.
4.79	0.3886	1.13	Q	.	.	.	.
4.94	0.4024	1.14	Q	.	.	.	.
5.08	0.4164	1.15	Q	.	.	.	.
5.23	0.4305	1.16	Q	.	.	.	.
5.38	0.4447	1.17	Q	.	.	.	.
5.53	0.4590	1.18	Q	.	.	.	.
5.67	0.4735	1.19	Q	.	.	.	.
5.82	0.4880	1.20	Q	.	.	.	.
5.97	0.5028	1.21	Q	.	.	.	.
6.12	0.5176	1.23	Q	.	.	.	.
6.26	0.5326	1.23	Q	.	.	.	.
6.41	0.5477	1.25	Q	.	.	.	.
6.56	0.5630	1.26	Q	.	.	.	.
6.71	0.5784	1.27	Q	.	.	.	.
6.86	0.5940	1.28	Q	.	.	.	.
7.00	0.6097	1.30	Q	.	.	.	.
7.15	0.6256	1.31	Q	.	.	.	.
7.30	0.6416	1.33	Q	.	.	.	.
7.44	0.6578	1.33	Q	.	.	.	.
7.59	0.6742	1.35	Q	.	.	.	.
7.74	0.6908	1.36	Q	.	.	.	.
7.89	0.7075	1.38	Q	.	.	.	.
8.03	0.7245	1.39	Q	.	.	.	.
8.18	0.7416	1.42	Q	.	.	.	.
8.33	0.7589	1.43	Q	.	.	.	.
8.48	0.7765	1.45	Q	.	.	.	.
8.62	0.7942	1.46	Q	.	.	.	.
8.77	0.8122	1.49	Q	.	.	.	.
8.92	0.8304	1.50	Q	.	.	.	.
9.07	0.8488	1.53	.Q	.	.	.	.
9.21	0.8675	1.54	.Q	.	.	.	.
9.36	0.8864	1.57	.Q	.	.	.	.
9.51	0.9056	1.58	.Q	.	.	.	.
9.66	0.9251	1.61	.Q	.	.	.	.
9.80	0.9448	1.63	.Q	.	.	.	.
9.95	0.9649	1.66	.Q	.	.	.	.
10.10	0.9852	1.68	.Q	.	.	.	.
10.25	1.0058	1.71	.Q	.	.	.	.
10.40	1.0268	1.73	.Q	.	.	.	.
10.54	1.0481	1.77	.Q	.	.	.	.
10.69	1.0698	1.79	.Q	.	.	.	.
10.84	1.0918	1.83	.Q	.	.	.	.
10.98	1.1143	1.85	.Q	.	.	.	.
11.13	1.1371	1.90	.Q	.	.	.	.
11.28	1.1604	1.92	.Q	.	.	.	.
11.43	1.1841	1.97	.Q	.	.	.	.
11.57	1.2082	2.00	.Q	.	.	.	.
11.72	1.2329	2.05	.Q	.	.	.	.
11.87	1.2581	2.08	.Q	.	.	.	.
12.02	1.2839	2.14	.Q	.	.	.	.

12.16	1.3121	2.49	.Q	.	.	.	.
12.31	1.3439	2.72	.Q	.	.	.	.
12.46	1.3773	2.76	.Q	.	.	.	.
12.61	1.4114	2.84	.Q	.	.	.	.
12.76	1.4463	2.89	.Q	.	.	.	.
12.90	1.4821	2.98	.Q	.	.	.	.
13.05	1.5188	3.03	. Q	.	.	.	.
13.20	1.5564	3.14	. Q	.	.	.	.
13.35	1.5951	3.20	. Q	.	.	.	.
13.49	1.6349	3.33	. Q	.	.	.	.
13.64	1.6760	3.40	. Q	.	.	.	.
13.79	1.7184	3.56	. Q	.	.	.	.
13.93	1.7624	3.66	. Q	.	.	.	.
14.08	1.8088	3.96	. Q	.	.	.	.
14.23	1.8586	4.21	. Q	.	.	.	.
14.38	1.9117	4.51	. Q	.	.	.	.
14.52	1.9676	4.68	. Q	.	.	.	.
14.67	2.0270	5.07	. Q	.	.	.	.
14.82	2.0902	5.30	. Q	.	.	.	.
14.97	2.1582	5.85	. Q	.	.	.	.
15.12	2.2315	6.18	. Q	.	.	.	.
15.26	2.3119	7.01	. Q	.	.	.	.
15.41	2.4007	7.56	. Q	.	.	.	.
15.56	2.4942	7.80	. Q	.	.	.	.
15.70	2.5960	8.90	. Q	.	.	.	.
15.85	2.7316	13.34	.	Q	.	.	.
16.00	2.9257	18.51	.	.	Q	.	.
16.15	3.3875	57.25	.	.	.	Q	.
16.30	3.8010	10.60	.	Q	.	.	.
16.44	3.9098	7.25	. Q	.	.	.	.
16.59	3.9939	6.56	. Q	.	.	.	.
16.74	4.0678	5.56	. Q	.	.	.	.
16.89	4.1313	4.86	. Q	.	.	.	.
17.03	4.1875	4.35	. Q	.	.	.	.
17.18	4.2370	3.77	. Q	.	.	.	.
17.33	4.2812	3.48	. Q	.	.	.	.
17.48	4.3223	3.27	. Q	.	.	.	.
17.62	4.3610	3.09	. Q	.	.	.	.
17.77	4.3977	2.93	.Q	.	.	.	.
17.92	4.4326	2.80	.Q	.	.	.	.
18.07	4.4660	2.68	.Q	.	.	.	.
18.21	4.4952	2.11	.Q	.	.	.	.
18.36	4.5205	2.02	.Q	.	.	.	.
18.51	4.5446	1.94	.Q	.	.	.	.
18.66	4.5679	1.87	.Q	.	.	.	.
18.80	4.5903	1.81	.Q	.	.	.	.
18.95	4.6120	1.75	.Q	.	.	.	.
19.10	4.6330	1.69	.Q	.	.	.	.
19.24	4.6533	1.64	.Q	.	.	.	.
19.39	4.6731	1.60	.Q	.	.	.	.
19.54	4.6923	1.55	.Q	.	.	.	.
19.69	4.7110	1.51	.Q	.	.	.	.
19.83	4.7292	1.47	Q	.	.	.	.
19.98	4.7469	1.44	Q	.	.	.	.
20.13	4.7642	1.41	Q	.	.	.	.
20.28	4.7812	1.37	Q	.	.	.	.
20.42	4.7978	1.34	Q	.	.	.	.

20.57	4.8140	1.32	Q	.	.	.	.
20.72	4.8299	1.29	Q	.	.	.	.
20.87	4.8454	1.26	Q	.	.	.	.
21.02	4.8607	1.24	Q	.	.	.	.
21.16	4.8757	1.22	Q	.	.	.	.
21.31	4.8904	1.20	Q	.	.	.	.
21.46	4.9048	1.18	Q	.	.	.	.
21.61	4.9190	1.16	Q	.	.	.	.
21.75	4.9330	1.14	Q	.	.	.	.
21.90	4.9467	1.12	Q	.	.	.	.
22.05	4.9603	1.10	Q	.	.	.	.
22.20	4.9736	1.08	Q	.	.	.	.
22.34	4.9867	1.07	Q	.	.	.	.
22.49	4.9996	1.05	Q	.	.	.	.
22.64	5.0123	1.04	Q	.	.	.	.
22.78	5.0249	1.02	Q	.	.	.	.
22.93	5.0373	1.01	Q	.	.	.	.
23.08	5.0495	1.00	Q	.	.	.	.
23.23	5.0615	0.98	Q	.	.	.	.
23.38	5.0734	0.97	Q	.	.	.	.
23.52	5.0852	0.96	Q	.	.	.	.
23.67	5.0968	0.95	Q	.	.	.	.
23.82	5.1082	0.93	Q	.	.	.	.
23.97	5.1196	0.92	Q	.	.	.	.
24.11	5.1308	0.91	Q	.	.	.	.
24.26	5.1363	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
=====	=====
0%	1442.6
10%	106.2
20%	26.6
30%	17.7
40%	8.9
50%	8.9
60%	8.9
70%	8.9
80%	8.9
90%	8.9

Appendix 10

Unit Hydrograph Volume Calculation Proposed Condition

NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)
AND LOW LOSS FRACTION ESTIMATIONS

=====

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Ver. 21.0 Release Date: 06/01/2014 License ID 1355

Analysis prepared by:

Fusco Engineering
16795 Von Karman
Suite 100
Irvine, CA 92606

Problem Descriptions:

RELATED BRISTOL
2-YEAR HYDROGRAPH
PROPOSED CONDITION

=====

*** NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)
AND LOW LOSS FRACTION ESTIMATIONS FOR AMC I:

TOTAL 24-HOUR DURATION RAINFALL DEPTH = 2.05 (inches)

SOIL-COVER TYPE	AREA (Acres)	PERCENT OF PERVIOUS AREA	SCS CURVE NUMBER	LOSS RATE Fp (in./hr.)	YIELD
1	41.15	14.00	69. (AMC II)	0.250	0.765

TOTAL AREA (Acres) = 41.15

AREA-AVERAGED LOSS RATE, \bar{F}_m (in./hr.) = 0.035

AREA-AVERAGED LOW LOSS FRACTION, \bar{Y} = 0.235

=====

NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)
AND LOW LOSS FRACTION ESTIMATIONS

=====

(C) Copyright 1989-2014 Advanced Engineering Software (aes)
Ver. 21.0 Release Date: 06/01/2014 License ID 1355

Analysis prepared by:

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16795 Von Karman
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Problem Descriptions:

RELATED BRISTOL
 2-YEAR HYDROGRAPH
 PROPOSED CONDITION

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 AND LOW LOSS FRACTION ESTIMATIONS FOR AMC I:

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TOTAL AREA (Acres) = 41.15

AREA-AVERAGED LOSS RATE, \bar{F}_m (in./hr.) = 0.035

AREA-AVERAGED LOW LOSS FRACTION, \bar{Y} = 0.235

Problem Descriptions:

RELATED BRISTOL
 2-YEAR HYDROGRAPH
 PROPOSED CONDITION (CALIB COEFF = 0.9412)

RATIONAL METHOD CALIBRATION COEFFICIENT = 0.94
 TOTAL CATCHMENT AREA (ACRES) = 41.15
 SOIL-LOSS RATE, F_m , (INCH/HR) = 0.025
 LOW LOSS FRACTION = 0.235
 TIME OF CONCENTRATION (MIN.) = 11.40
 SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
 ORANGE COUNTY "VALLEY" RAINFALL VALUES ARE USED
 RETURN FREQUENCY (YEARS) = 2
 5-MINUTE POINT RAINFALL VALUE (INCHES) = 0.19
 30-MINUTE POINT RAINFALL VALUE (INCHES) = 0.40
 1-HOUR POINT RAINFALL VALUE (INCHES) = 0.53
 3-HOUR POINT RAINFALL VALUE (INCHES) = 0.89
 6-HOUR POINT RAINFALL VALUE (INCHES) = 1.22
 24-HOUR POINT RAINFALL VALUE (INCHES) = 2.05

TOTAL CATCHMENT RUNOFF VOLUME (ACRE-FEET) = 5.47
 TOTAL CATCHMENT SOIL-LOSS VOLUME (ACRE-FEET) = 1.55

TIME (HOURS)	VOLUME (AF)	Q (CFS)	0.	15.0	30.0	45.0	60.0
0.04	0.0000	0.00	Q	.	.	.	.
0.23	0.0075	0.95	Q	.	.	.	.
0.42	0.0224	0.96	Q	.	.	.	.
0.61	0.0375	0.97	Q	.	.	.	.
0.80	0.0527	0.97	Q	.	.	.	.
0.99	0.0681	0.98	Q	.	.	.	.

1.18	0.0835	0.99	Q	.	.	.	.
1.37	0.0991	1.00	Q	.	.	.	.
1.56	0.1148	1.00	Q	.	.	.	.
1.75	0.1306	1.01	Q	.	.	.	.
1.94	0.1465	1.02	Q	.	.	.	.
2.13	0.1626	1.03	Q	.	.	.	.
2.32	0.1788	1.04	Q	.	.	.	.
2.51	0.1952	1.05	Q	.	.	.	.
2.70	0.2117	1.05	Q	.	.	.	.
2.89	0.2284	1.07	Q	.	.	.	.
3.08	0.2452	1.07	Q	.	.	.	.
3.27	0.2621	1.09	Q	.	.	.	.
3.46	0.2792	1.09	Q	.	.	.	.
3.65	0.2965	1.11	Q	.	.	.	.
3.84	0.3139	1.11	Q	.	.	.	.
4.03	0.3316	1.13	Q	.	.	.	.
4.22	0.3493	1.14	Q	.	.	.	.
4.41	0.3673	1.15	Q	.	.	.	.
4.60	0.3854	1.16	Q	.	.	.	.
4.79	0.4038	1.18	Q	.	.	.	.
4.98	0.4223	1.18	Q	.	.	.	.
5.17	0.4410	1.20	Q	.	.	.	.
5.36	0.4599	1.21	Q	.	.	.	.
5.55	0.4791	1.23	Q	.	.	.	.
5.74	0.4984	1.24	Q	.	.	.	.
5.93	0.5180	1.26	Q	.	.	.	.
6.12	0.5378	1.27	Q	.	.	.	.
6.31	0.5578	1.29	Q	.	.	.	.
6.50	0.5781	1.30	Q	.	.	.	.
6.69	0.5986	1.32	Q	.	.	.	.
6.88	0.6194	1.33	Q	.	.	.	.
7.07	0.6405	1.35	Q	.	.	.	.
7.26	0.6618	1.36	Q	.	.	.	.
7.45	0.6834	1.39	Q	.	.	.	.
7.64	0.7053	1.40	Q	.	.	.	.
7.83	0.7276	1.43	Q	.	.	.	.
8.02	0.7501	1.44	Q	.	.	.	.
8.21	0.7730	1.47	Q	.	.	.	.
8.40	0.7962	1.49	Q	.	.	.	.
8.59	0.8198	1.52	.Q	.	.	.	.
8.78	0.8438	1.53	.Q	.	.	.	.
8.97	0.8681	1.57	.Q	.	.	.	.
9.16	0.8929	1.58	.Q	.	.	.	.
9.35	0.9180	1.62	.Q	.	.	.	.
9.54	0.9437	1.64	.Q	.	.	.	.
9.73	0.9697	1.68	.Q	.	.	.	.
9.92	0.9963	1.70	.Q	.	.	.	.
10.11	1.0234	1.75	.Q	.	.	.	.
10.30	1.0510	1.77	.Q	.	.	.	.
10.49	1.0792	1.82	.Q	.	.	.	.
10.68	1.1080	1.85	.Q	.	.	.	.
10.87	1.1374	1.90	.Q	.	.	.	.
11.06	1.1675	1.93	.Q	.	.	.	.
11.25	1.1983	1.99	.Q	.	.	.	.
11.44	1.2298	2.03	.Q	.	.	.	.
11.63	1.2622	2.10	.Q	.	.	.	.
11.82	1.2954	2.13	.Q	.	.	.	.

12.01	1.3295	2.22	.Q	.	.	.	.
12.20	1.3669	2.54	.Q	.	.	.	.
12.39	1.4092	2.84	.Q	.	.	.	.
12.58	1.4543	2.90	.Q	.	.	.	.
12.77	1.5007	3.02	. Q	.	.	.	.
12.96	1.5486	3.08	. Q	.	.	.	.
13.15	1.5982	3.24	. Q	.	.	.	.
13.34	1.6499	3.34	. Q	.	.	.	.
13.53	1.7041	3.57	. Q	.	.	.	.
13.72	1.7611	3.69	. Q	.	.	.	.
13.91	1.8213	3.98	. Q	.	.	.	.
14.10	1.8850	4.14	. Q	.	.	.	.
14.29	1.9544	4.70	. Q	.	.	.	.
14.48	2.0300	4.92	. Q	.	.	.	.
14.67	2.1114	5.44	. Q	.	.	.	.
14.86	2.1993	5.76	. Q	.	.	.	.
15.05	2.2960	6.55	. Q	.	.	.	.
15.24	2.4029	7.07	. Q	.	.	.	.
15.43	2.5224	8.15	. Q	.	.	.	.
15.62	2.6507	8.20	. Q	.	.	.	.
15.81	2.8114	12.27	.	Q	.	.	.
16.00	3.0431	17.24	.	.	.Q	.	.
16.19	3.5991	53.58	.	.	.	Q	.
16.38	4.0958	9.69	.	Q	.	.	.
16.57	4.2323	7.70	.	Q	.	.	.
16.76	4.3409	6.12	.	Q	.	.	.
16.95	4.4295	5.17	.	Q	.	.	.
17.14	4.5051	4.47	. Q	.	.	.	.
17.33	4.5703	3.83	. Q	.	.	.	.
17.52	4.6274	3.45	. Q	.	.	.	.
17.71	4.6792	3.15	. Q	.	.	.	.
17.90	4.7271	2.96	.Q	.	.	.	.
18.09	4.7723	2.79	.Q	.	.	.	.
18.28	4.8113	2.17	.Q	.	.	.	.
18.47	4.8445	2.06	.Q	.	.	.	.
18.66	4.8761	1.96	.Q	.	.	.	.
18.85	4.9062	1.87	.Q	.	.	.	.
19.04	4.9350	1.79	.Q	.	.	.	.
19.23	4.9626	1.72	.Q	.	.	.	.
19.42	4.9892	1.66	.Q	.	.	.	.
19.61	5.0148	1.60	.Q	.	.	.	.
19.80	5.0396	1.55	.Q	.	.	.	.
19.99	5.0635	1.50	.Q	.	.	.	.
20.18	5.0868	1.46	Q	.	.	.	.
20.37	5.1093	1.42	Q	.	.	.	.
20.56	5.1312	1.38	Q	.	.	.	.
20.75	5.1526	1.34	Q	.	.	.	.
20.94	5.1734	1.31	Q	.	.	.	.
21.13	5.1937	1.28	Q	.	.	.	.
21.32	5.2135	1.25	Q	.	.	.	.
21.51	5.2328	1.22	Q	.	.	.	.
21.70	5.2517	1.19	Q	.	.	.	.
21.89	5.2703	1.17	Q	.	.	.	.
22.08	5.2884	1.14	Q	.	.	.	.
22.27	5.3062	1.12	Q	.	.	.	.
22.46	5.3236	1.10	Q	.	.	.	.
22.65	5.3407	1.08	Q	.	.	.	.

22.84	5.3575	1.06	Q	.	.	.	.
23.03	5.3740	1.04	Q	.	.	.	.
23.22	5.3903	1.02	Q	.	.	.	.
23.41	5.4062	1.01	Q	.	.	.	.
23.60	5.4219	0.99	Q	.	.	.	.
23.79	5.4374	0.98	Q	.	.	.	.
23.98	5.4526	0.96	Q	.	.	.	.
24.17	5.4676	0.95	Q	.	.	.	.
24.36	5.4750	0.00	Q	.	.	.	.

 TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
 (Note: 100% of Peak Flow Rate estimate assumed to have
 an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
=====	=====
0%	1447.8
10%	136.8
20%	34.2
30%	22.8
40%	11.4
50%	11.4
60%	11.4
70%	11.4
80%	11.4
90%	11.4

Appendix 11

Storm Drain Hydraulics

Worksheet for Existing 30-inch SD in MacArthur

Project Description

Friction Method	Manning Formula	Existing 30-inch storm drain lateral mid-block in MacArthur Boulevard
Solve For	Full Flow Capacity	

Input Data

Roughness Coefficient	0.013
Channel Slope	0.0250 ft/ft
Normal Depth	30.0 in
Diameter	30.0 in
Discharge	67.4 cfs

Results

Discharge	67.4 cfs
Normal Depth	30.0 in
Flow Area	4.9 ft ²
Wetted Perimeter	7.9 ft
Hydraulic Radius	7.5 in
Top Width	0.00 ft
Critical Depth	29.2 in
Percent Full	100.0 %
Critical Slope	0.0221 ft/ft
Velocity	13.74 ft/s
Velocity Head	2.93 ft
Specific Energy	5.43 ft
Froude Number	(N/A)
Maximum Discharge	72.6 cfs
Discharge Full	67.4 cfs
Slope Full	0.0250 ft/ft
Flow Type	Undefined

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	100.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	30.0 in
Critical Depth	29.2 in
Channel Slope	0.0250 ft/ft
Critical Slope	0.0221 ft/ft

Worksheet for Existing 33-inch SD in Plaza at MacArthur

Project Description		
Friction Method	Manning Formula	Existing 33-inch storm drain lateral in Plaza at MacArthur Boulevard
Solve For	Full Flow Capacity	
Input Data		
Roughness Coefficient	0.013	
Channel Slope	0.0034 ft/ft	
Normal Depth	33.0 in	
Diameter	33.0 in	
Discharge	30.84 cfs	
Results		
Discharge	30.84 cfs	
Normal Depth	33.0 in	
Flow Area	5.9 ft ²	
Wetted Perimeter	8.6 ft	
Hydraulic Radius	8.3 in	
Top Width	0.00 ft	
Critical Depth	22.2 in	
Percent Full	100.0 %	
Critical Slope	0.0054 ft/ft	
Velocity	5.19 ft/s	
Velocity Head	0.42 ft	
Specific Energy	3.17 ft	
Froude Number	(N/A)	
Maximum Discharge	33.17 cfs	
Discharge Full	30.84 cfs	
Slope Full	0.0034 ft/ft	
Flow Type	Undefined	
GVF Input Data		
Downstream Depth	0.0 in	
Length	0.0 ft	
Number Of Steps	0	
GVF Output Data		
Upstream Depth	0.0 in	
Profile Description	N/A	
Profile Headloss	0.00 ft	
Average End Depth Over Rise	0.0 %	
Normal Depth Over Rise	100.0 %	
Downstream Velocity	Infinity ft/s	
Upstream Velocity	Infinity ft/s	
Normal Depth	33.0 in	
Critical Depth	22.2 in	
Channel Slope	0.0034 ft/ft	
Critical Slope	0.0054 ft/ft	

Appendix 12

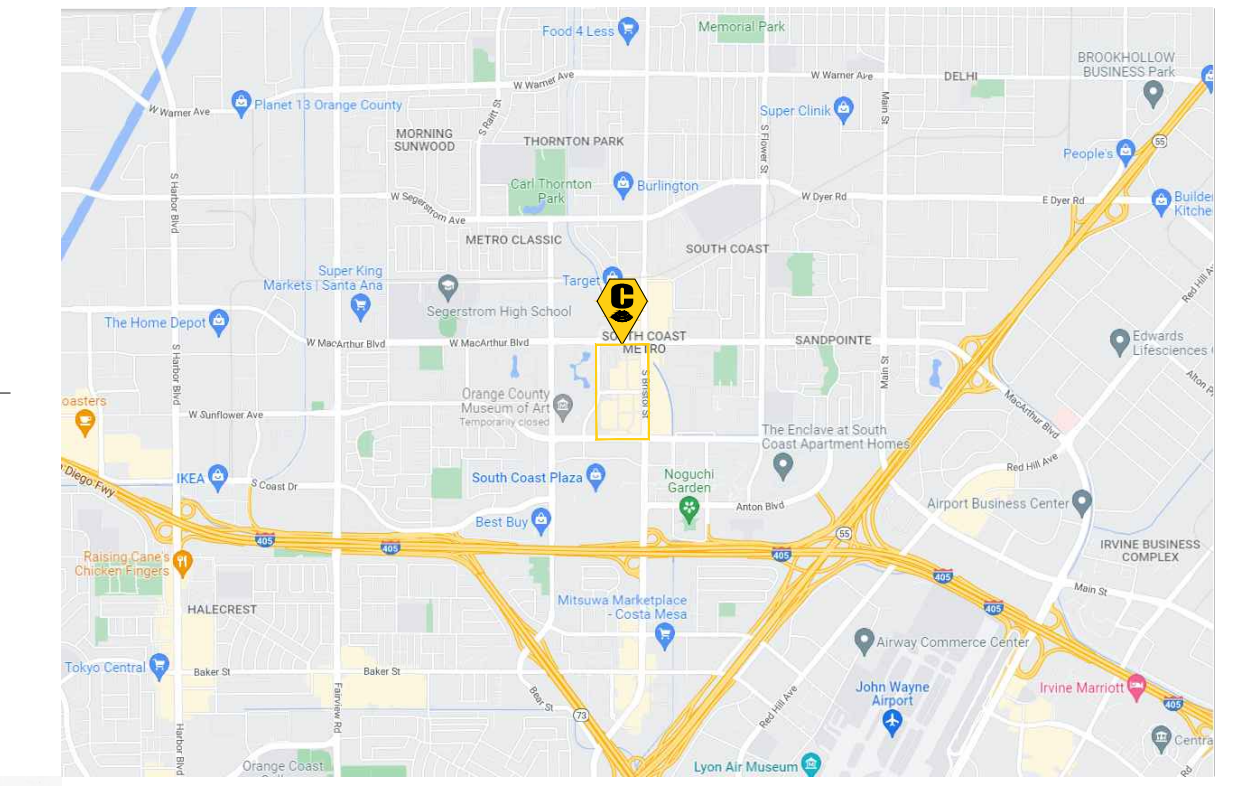
CBelow Scanning Results

UNDERGROUND UTILITY MAP

WITHIN THE CITY OF SANTA ANA, COUNTY OF ORANGE, CALIFORNIA

PREPARED FOR:

FUSCOE ENGINEERING



VICINITY MAP
NOT TO SCALE

UTILITY QUALITY LEVELS NOTES

INFORMATION PROVIDED FROM AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE) CI/ASCE 38-02 MANUAL.

UTILITY QUALITY LEVEL A

PRECISE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES OBTAINED BY THE ACTUAL EXPOSURE (OR VERIFICATION OF PREVIOUSLY EXPOSED AND SURVEYED UTILITIES) AND SUBSEQUENT MEASUREMENT OF SUBSURFACE UTILITIES, USUALLY AT A SPECIFIC POINT. MINIMALLY INTRUSIVE EXCAVATION EQUIPMENT IS TYPICALLY USED TO MINIMIZE THE POTENTIAL FOR UTILITY DAMAGE. A PRECISE HORIZONTAL AND VERTICAL LOCATION, AS WELL AS OTHER UTILITY ATTRIBUTES, IS SHOWN ON PLAN DOCUMENTS. ACCURACY IS TYPICALLY SET TO 15-MM VERTICAL AND TO APPLICABLE HORIZONTAL SURVEY AND MAPPING ACCURACY AS DEFINED OR EXPECTED BY THE PROJECT OWNER.

UTILITY QUALITY LEVEL B

INFORMATION OBTAINED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF SUBSURFACE UTILITIES. QUALITY LEVEL B DATA SHOULD BE REPRODUCIBLE BY SURFACE GEOPHYSICS AT ANY POINT OF THEIR DEPICTION. THIS INFORMATION IS SURVEYED TO APPLICABLE TOLERANCES DEFINED BY THE PROJECT AND REDUCED ONTO PLAN DOCUMENTS.

UTILITY QUALITY LEVEL C

INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE-GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGMENT IN CORRELATING THIS INFORMATION TO QUALITY LEVEL D INFORMATION.

UTILITY QUALITY LEVEL D

INFORMATION DERIVED FROM EXISTING RECORDS OR ORAL RECOLLECTIONS.

UTILITY NOTES

- FACILITIES (UTILITY LINES) SHALL BE LOCATED AND MARKED PRIOR TO EXCAVATION. CALL (800) 90-BELOW.
- CONTRACTOR SHALL HAND-EXPOSE TO A POINT OF NO CONFLICT 24" ON EITHER SIDE OF THE UNDERGROUND FACILITY, REGARDLESS OF THE ESTIMATED DEPTH.
- DEPTHS SHOWN ARE APPROXIMATE. ESTIMATED DEPTHS ARE FROM THE GROUND SURFACE TO THE CENTER OF THE FACILITY, INVERT OF WASTE LINES, OR TO THE FACILITY TRACER WIRE. DEPTH ESTIMATES SHOULD BE USED WITH CAUTION AND MAY VARY ALONG THE LENGTH OF THE FACILITY.
- UTILITY BRACKETS ARE SHOWN TO DEMONSTRATE MULTIPLE LINES TRAVELING TOGETHER IN EITHER A DUCTBANK OR BUNDLE.
- THE SCOPE OF THIS SURVEY DOES NOT INCLUDE FACILITY SIZE OR NUMBER OF CONDUIT IN MULTIPLE CONDUIT RUNS. IRRIGATION LINES ARE NOT INCLUDED IN THIS SURVEY.
- THE BACKGROUND SITE PLAN USED IN PREPARING THIS MAP WAS PREPARED BY OTHERS AND PROVIDED TO C BELOW BY THE CLIENT. C BELOW MAKES NO REPRESENTATION AS TO THE ACCURACY OF THE PLAN.
- IN THE EVENT THE INFORMATION SHOWN IN THIS PLAN VARIES FROM THE ACTUAL SITE CONDITIONS, C BELOW SHALL BE NOTIFIED WITHIN 24 HOURS AFTER DISCOVERY OF THE CONFLICT.

UNDERGROUND LINE LEGEND

UTILITY QUALITY LEVEL B:

- ELECTRICAL — E —
- GAS — G —
- COMMUNICATION — C —
- WATER — W —
- SANITARY SEWER — SS —
- STORM DRAIN — SD —
- POSSIBLE LINE LOCATION, BASED ON GPR DETECTION — U —
- STREET LIGHT — SL —
- AIR — AIR —
- TRAFFIC SIGNAL — TS —
- FIRE WATER — FW —
- CHILLED WATER — CHW —
- HOT WATER — HW —
- RECLAIMED WATER — RW —

UTILITY QUALITY LEVEL C:

- ELECTRICAL - - - E - - -
- GAS - - - G - - -
- COMMUNICATION - - - C - - -
- WATER - - - W - - -
- SANITARY SEWER - - - SS - - -
- STORM DRAIN - - - SD - - -
- STREET LIGHT - - - SL - - -
- AIR - - - AIR - - -
- TRAFFIC SIGNAL - - - TS - - -
- FIRE WATER - - - FW - - -
- CHILLED WATER - - - CHW - - -
- HOT WATER - - - HW - - -
- RECLAIMED WATER - - - RW - - -

UTILITY QUALITY LEVEL D:

- ELECTRICAL — E —
- GAS — G —
- COMMUNICATION — C —
- WATER — W —
- SANITARY SEWER — SS —
- STORM DRAIN — SD —
- STREET LIGHT — SL —
- AIR — AIR —
- TRAFFIC SIGNAL — TS —
- FIRE WATER — FW —
- CHILLED WATER — CHW —
- HOT WATER — HW —
- RECLAIMED WATER — RW —

KEY NOTES

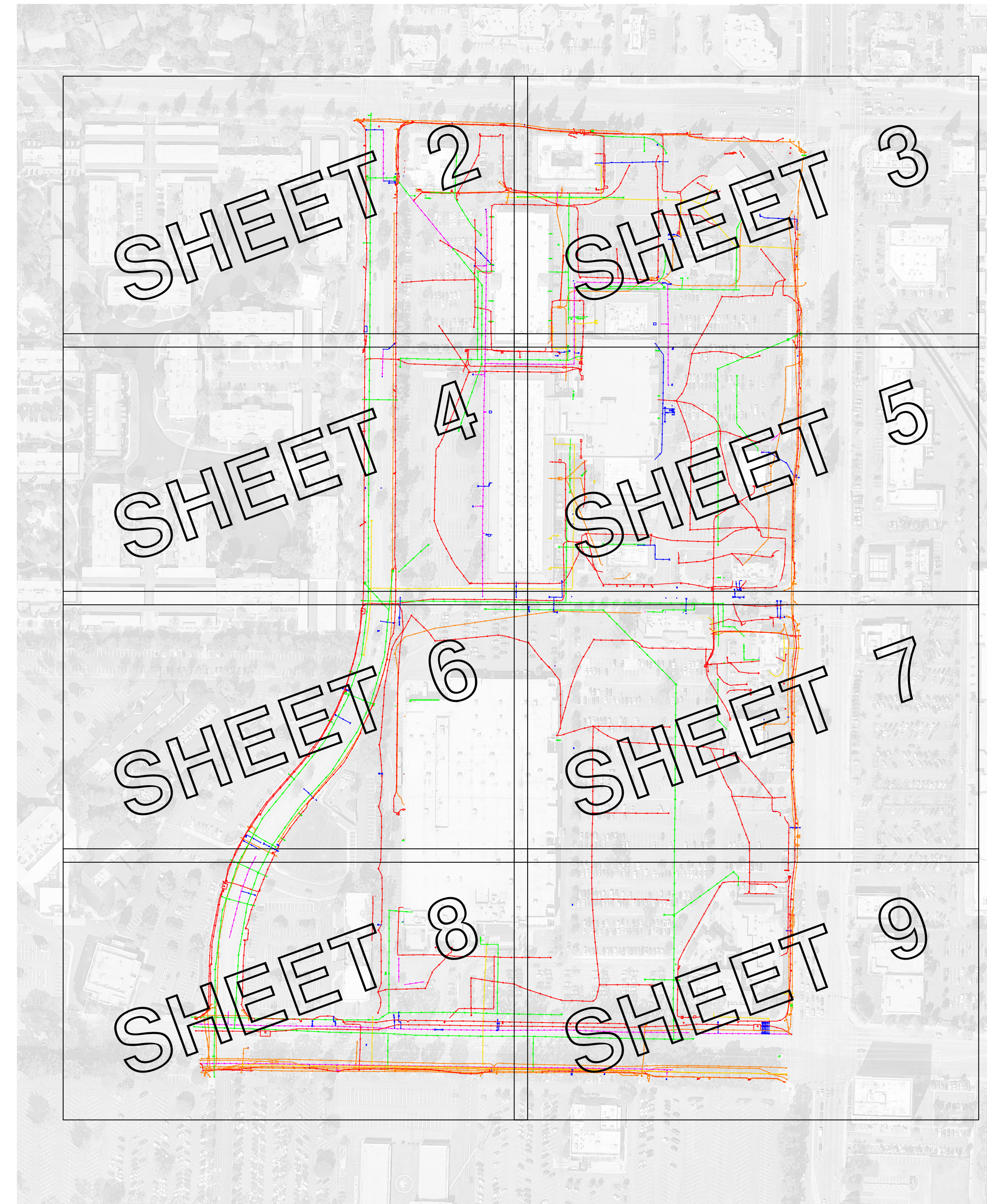
- NON-CONDUCTIVE, UNABLE TO LOCATE PAST THIS POINT.
- BLOCKED
- NO ACCESS, UNABLE TO LOCATE PAST THIS POINT.
- CANNOT PUSH FURTHER PAST THIS POINT.
- AT BUILDING
- AT DROP
- AT RISER
- CANNOT OPEN, UNABLE TO LOCATE PAST THIS POINT.

ABBREVIATIONS

- BFP BACKFLOW PREVENTER
- (C) COMMUNICATION
- (E) ELECTRIC
- FDC FIRE DEPARTMENT CONNECTION
- (G) GAS
- ICV IRRIGATION CONTROL VALVE
- PIV POST INDICATOR VALVE
- (RW) RECLAIMED WATER
- (SD) STORM DRAIN
- (SL) STREET LIGHT
- (SS) SANITARY SEWER
- (TS) TRAFFIC SIGNAL
- (U) UNKNOWN
- (W) WATER

LEGEND/SYMBOL

- BACKFLOW PREVENTER
- CLEAN OUT
- DEPTH FROM SURFACE
- INVERT
- INVERT DEPTH FROM TOP OF RIM OR GRATE
- FIRE HYDRANT
- LIGHT POLE
- MANHOLE
- PULL BOX
- TRAFFIC SIGNAL POLE
- VALVE
- VAULT



KEY MAP
NOT TO SCALE

NOTE:
BACKGROUND IMAGE IS FROM GOOGLE EARTH AND IS FOR REFERENCE ONLY.

NO BACKGROUND HAS BEEN PROVIDED BY CLIENT. ONCE BACKGROUND IS PROVIDED UTILITY MAP WILL BE UPDATED

UTILITY DEPICTION

UNDERGROUND UTILITY DEPICTION SHOWN HEREON IS BASED ON LOCAL CONTROL AND/OR ON THE SMARTNET RTK NETWORK, UNLESS STATED OTHERWISE.

DRAWING SHEETS	
SHEET NO.	SHEET TITLE
1	COVER SHEET
2-9	UTILITY MAP



C BELOW SUBSURFACE IMAGING
14280 EUCLID AVE
CHINO, CA 91710
P: 888-902-3569
F: 909-606-6555
www.cbelow.com

GROUND PENETRATING RADAR (GPR)
UTILITY LOCATING
RADIOGRAPHY
POTHOLING
MAPPING

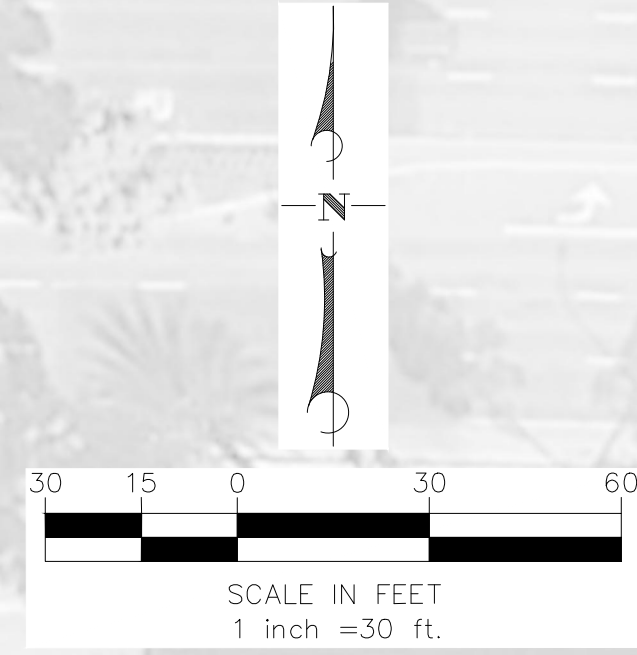
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PROJECT:
PARTIAL UNDERGROUND UTILITY MAP FOR:
BRISTOL COMMONS
W. MACARTHUR BLVD. & S. BRISTOL ST.
SANTA ANA, CA 92704

CLIENT:
FUSCOE ENGINEERING
16795 CON KARMAN, SUITE 100
IRVINE, CA 92606

REVISIONS			
NO	DATE	BY	DESCRIPTION

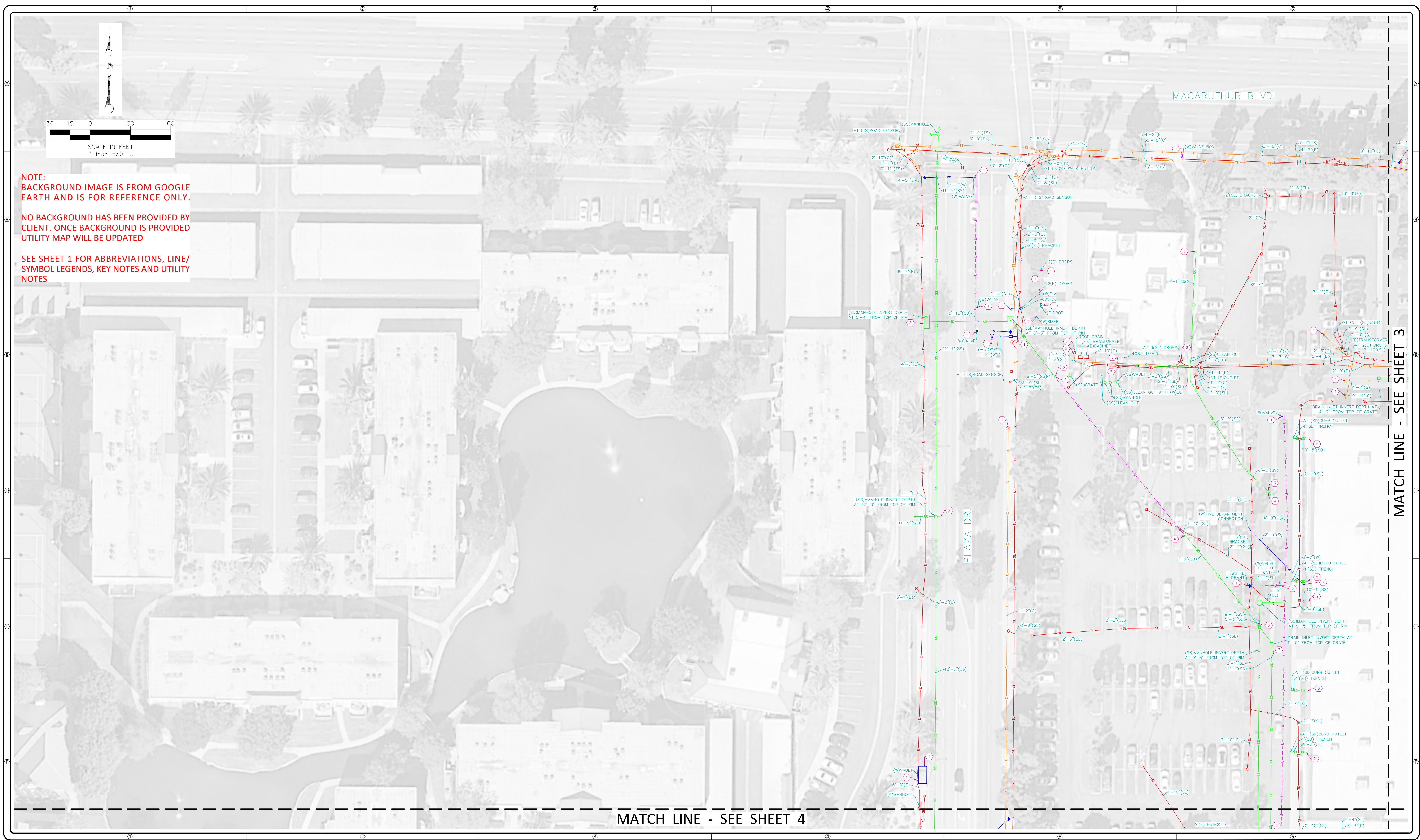
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DRAWN BY/DATE: OG 09/06/2022
TECHNICIAN
CHECK BY/DATE: G. DILLON
QC CHECKED BY/DATE: LB 09/30/2022
DRAWING NAME: COVER SHEET
PROJECT NO: 22-4939 SCALE: N.T.S.



NOTE:
BACKGROUND IMAGE IS FROM GOOGLE EARTH AND IS FOR REFERENCE ONLY.

NO BACKGROUND HAS BEEN PROVIDED BY CLIENT. ONCE BACKGROUND IS PROVIDED UTILITY MAP WILL BE UPDATED

SEE SHEET 1 FOR ABBREVIATIONS, LINE/SYMBOL LEGENDS, KEY NOTES AND UTILITY NOTES



MATCH LINE - SEE SHEET 3

MATCH LINE - SEE SHEET 4



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GROUND PENETRATING RADAR (GPR)
UTILITY LOCATING
RADIOGRAPHY
POTHOLING
MAPPING

NOTES: The services provided by C Below, Inc. do not relieve the Client and/or property owner of the responsibility of having to comply with California Government Code §54216-4216.9. It is expressly understood by the Client and/or owner that CBSI services are not a substitute for compliance with California Code §54216-4216.9.

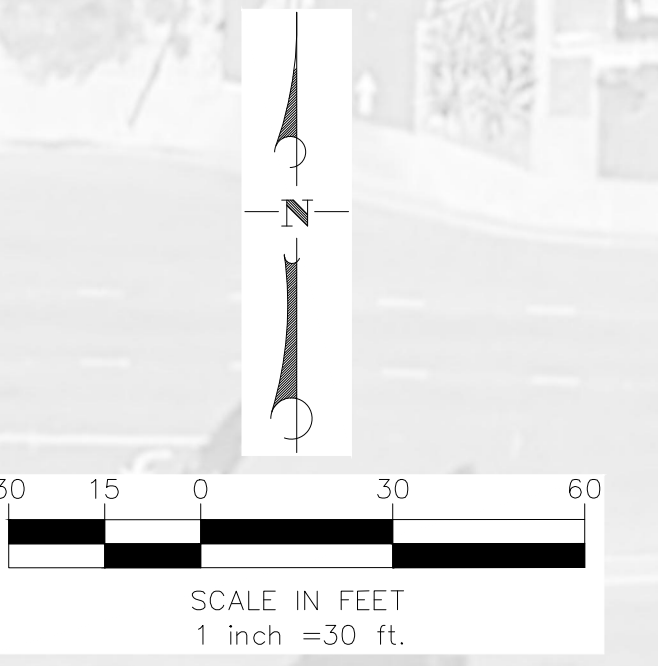
PROJECT:
PARTIAL UNDERGROUND UTILITY MAP FOR:
BRISTOL COMMONS
W. MACARTHUR BLVD. & S. BRISTOL ST.
SANTA ANA, CA 92704

CLIENT:
FUSCOE ENGINEERING
16795 CON KARMAN, SUITE 100
IRVINE, CA 92606

REVISIONS			
NO	DATE	BY	DESCRIPTION

DATE LOCATED: 08/2022
DRAWN BY/DATE: OG 09/06/2022
TECHNICIAN: G. DILLON
CHECK BY/DATE: LB 09/30/2022
DRAWING NAME: UTILITY MAP
PROJECT NO: 22-4939
SCALE: 1" = 30'

MACARTHUR BLVD.



NOTE: BACKGROUND IMAGE IS FROM GOOGLE EARTH AND IS FOR REFERENCE ONLY.

NO BACKGROUND HAS BEEN PROVIDED BY CLIENT. ONCE BACKGROUND IS PROVIDED UTILITY MAP WILL BE UPDATED

SEE SHEET 1 FOR ABBREVIATIONS, LINE/SYMBOL LEGENDS, KEY NOTES AND UTILITY NOTES

MATCH LINE - SEE SHEET 2

MATCH LINE - SEE SHEET 5



C BELOW SUBSURFACE IMAGING
 14280 EUCLID AVE
 CHINO, CA 91710
 P: 888-902-3569
 F: 909-606-6555
 www.cbelow.com

GROUND PENETRATING RADAR (GPR)
 UTILITY LOCATING
 RADIOGRAPHY
 POTHOLES MAPPING

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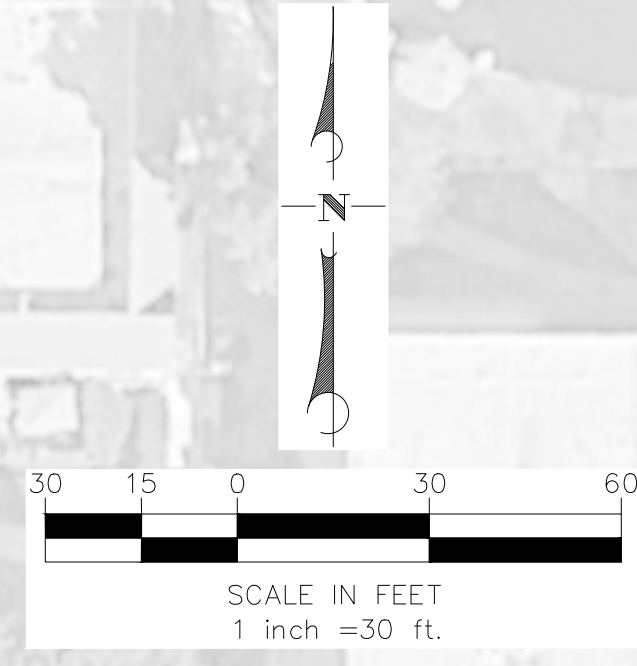
PROJECT:
 PARTIAL UNDERGROUND UTILITY MAP FOR:
BRISTOL COMMONS
 W. MACARTHUR BLVD. & S. BRISTOL ST.
 SANTA ANA, CA 92704

CLIENT:
FUSCOE ENGINEERING
 16795 CON KARMAN, SUITE 100
 IRVINE, CA 92606

REVISIONS			
NO	DATE	BY	DESCRIPTION

DATE LOCATED: 08/2022
 DRAWN BY/DATE: OG 09/06/2022
 TECHNICIAN CHECK BY/DATE: G. DILLON
 QC CHECKED BY/DATE: LB 09/30/2022
 DRAWING NAME: UTILITY MAP
 PROJECT NO: 22-4939 SCALE: 1" = 30'

MATCH LINE - SEE SHEET 2



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PLAZA DR.

MATCH LINE - SEE SHEET 6

MATCH LINE - SEE SHEET 5



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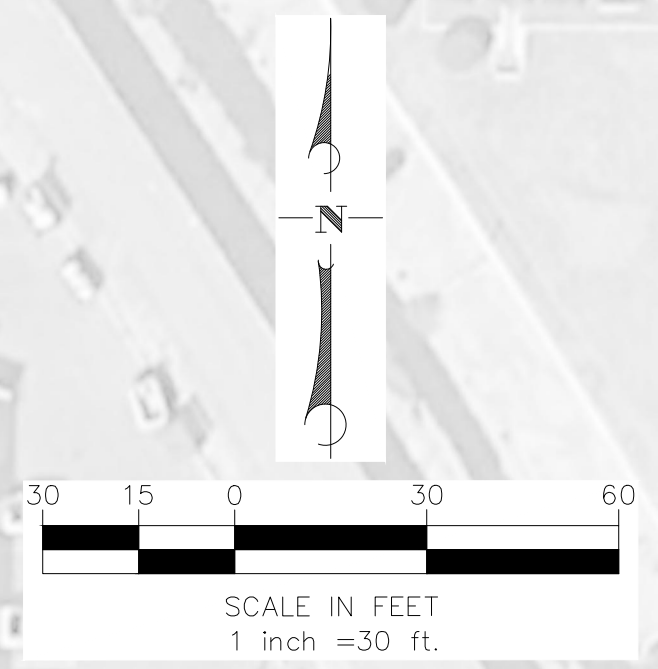
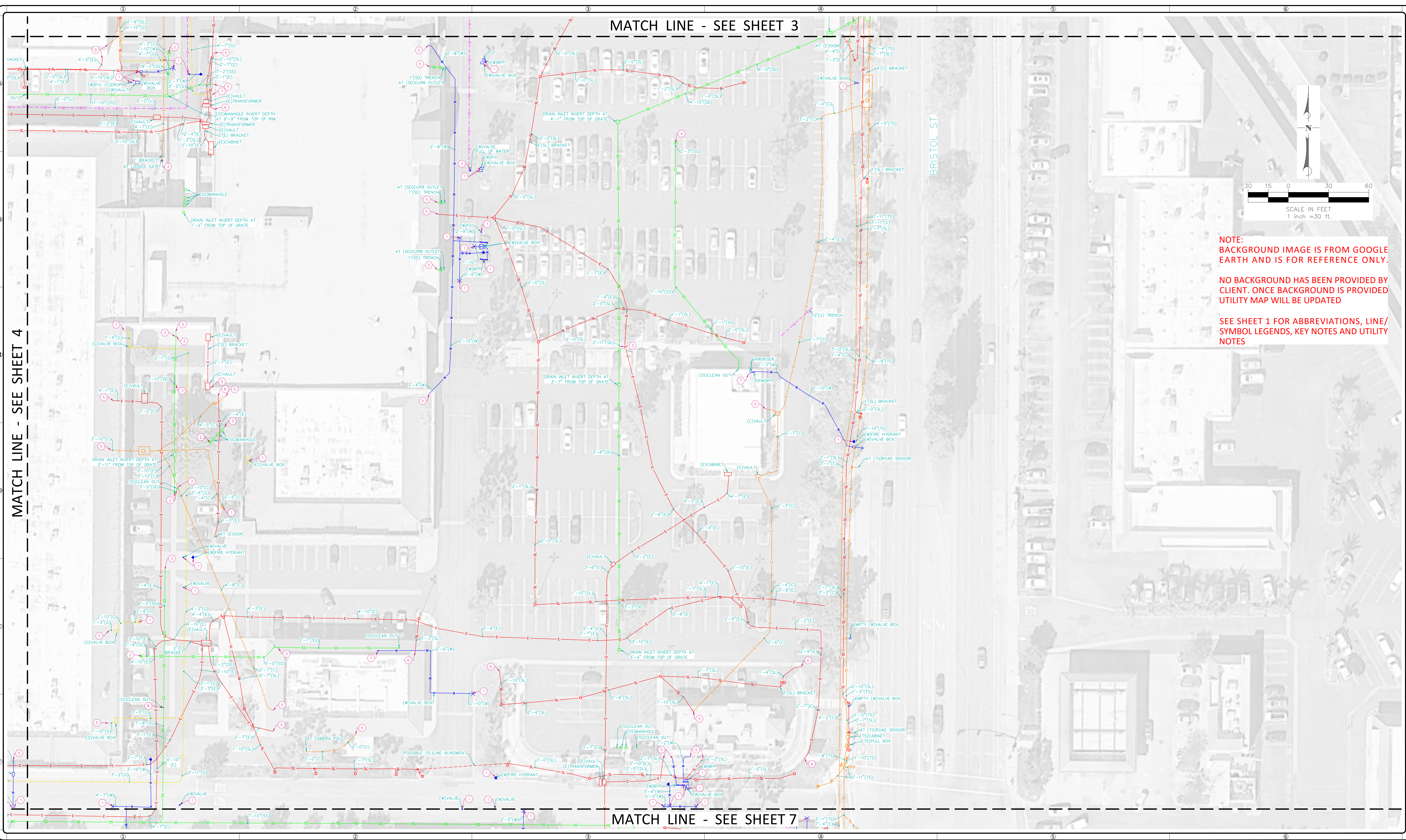
REVISIONS			
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 QC CHECKED BY/DATE: LB 09/30/2022
 DRAWING NAME: UTILITY MAP
 PROJECT NO: 22-4939
 SCALE: 1" = 30'

MATCH LINE - SEE SHEET 3

MATCH LINE - SEE SHEET 4

MATCH LINE - SEE SHEET 7



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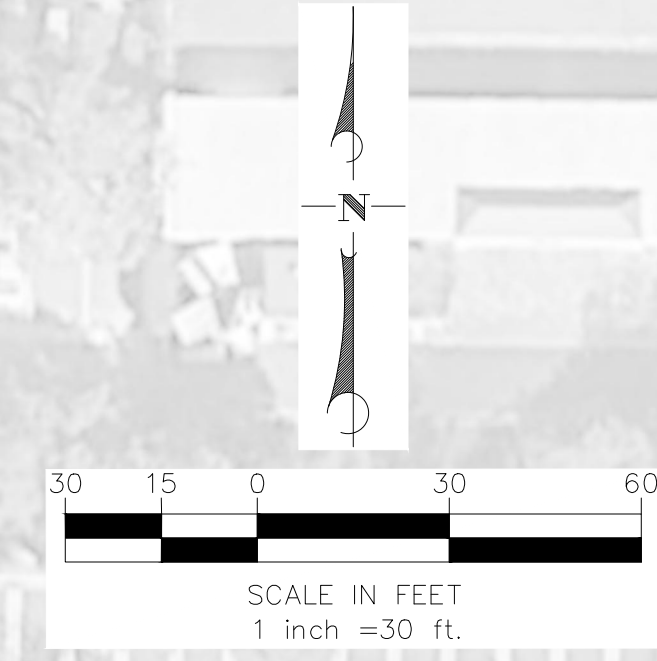
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 16795 CON KARMAN, SUITE 100
 IRVINE, CA 92606

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NO	DATE	BY	DESCRIPTION

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 TECHNICIAN: G. DILLON
 QC CHECKED BY/DATE: LB 09/30/2022
 DRAWING NAME: UTILITY MAP
 PROJECT NO: 22-4939 SCALE: 1" = 30'

SHEET 5 OF 9

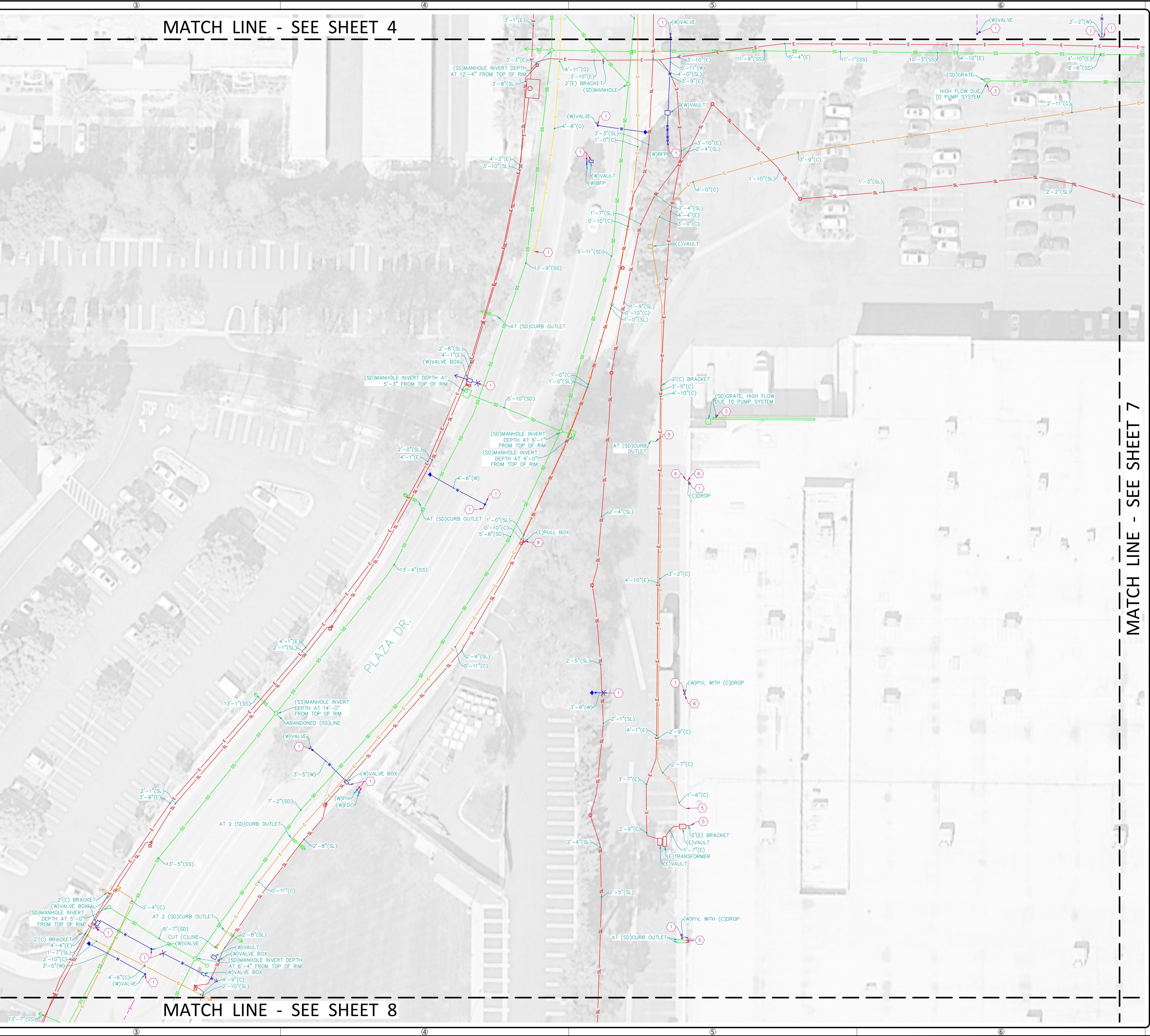
MATCH LINE - SEE SHEET 4



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MATCH LINE - SEE SHEET 7

MATCH LINE - SEE SHEET 8



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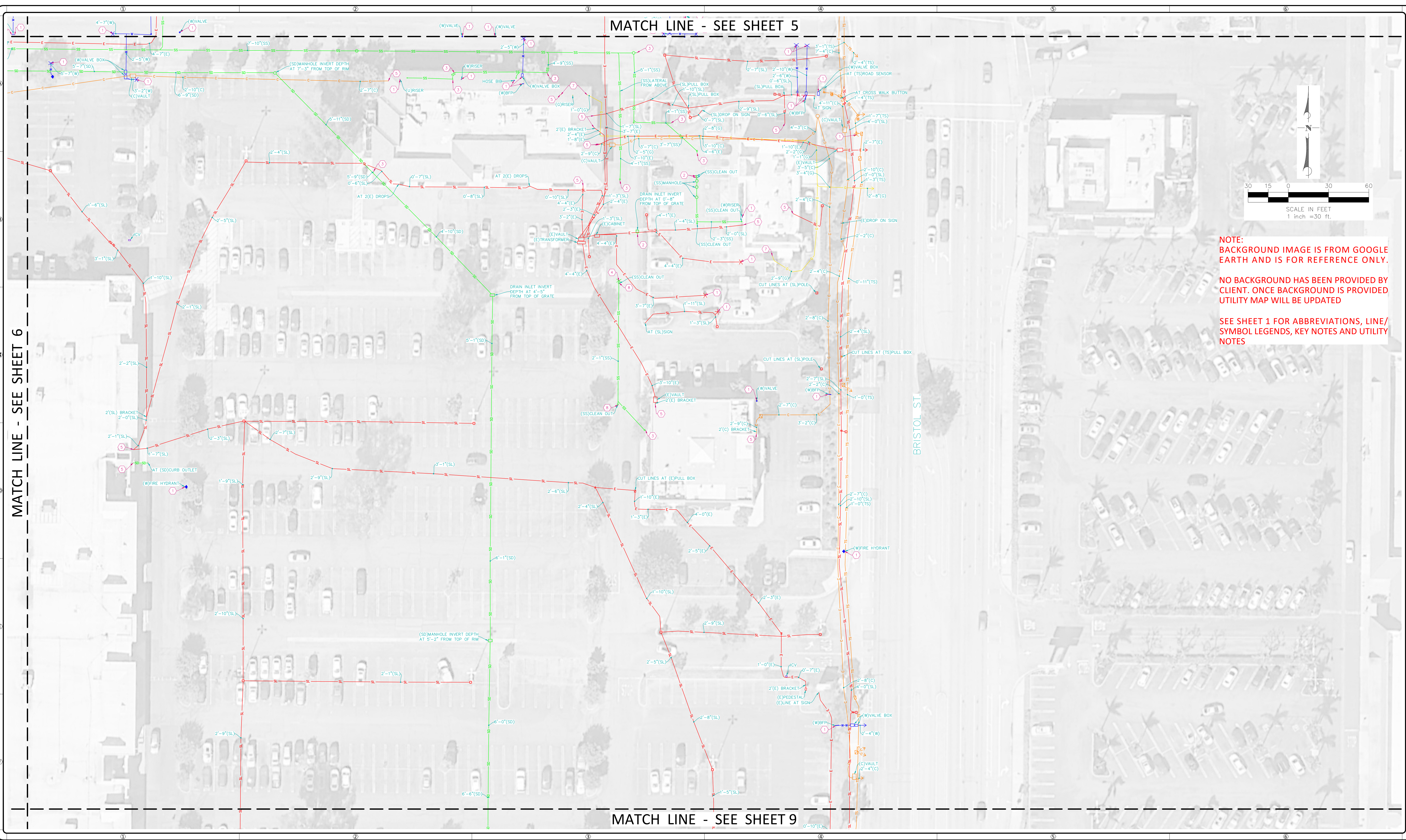
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DRAWING NAME: UTILITY MAP
PROJECT NO: 22-4939
SCALE: 1" = 30'



MATCH LINE - SEE SHEET 5

MATCH LINE - SEE SHEET 6

MATCH LINE - SEE SHEET 9

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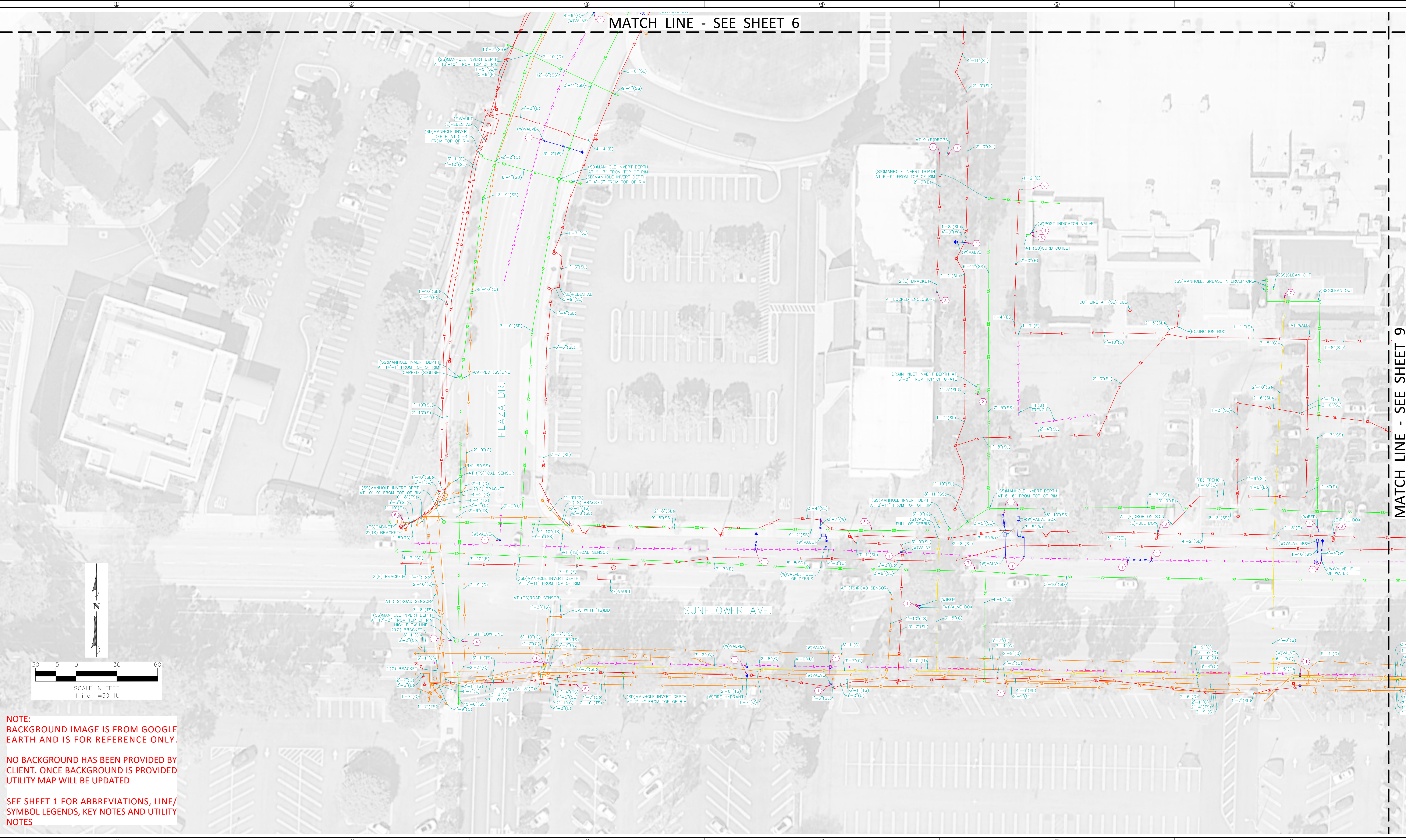
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DRAWING NAME: UTILITY MAP
PROJECT NO: 22-4939
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SHEET 7 OF 9

MATCH LINE - SEE SHEET 6

MATCH LINE - SEE SHEET 9



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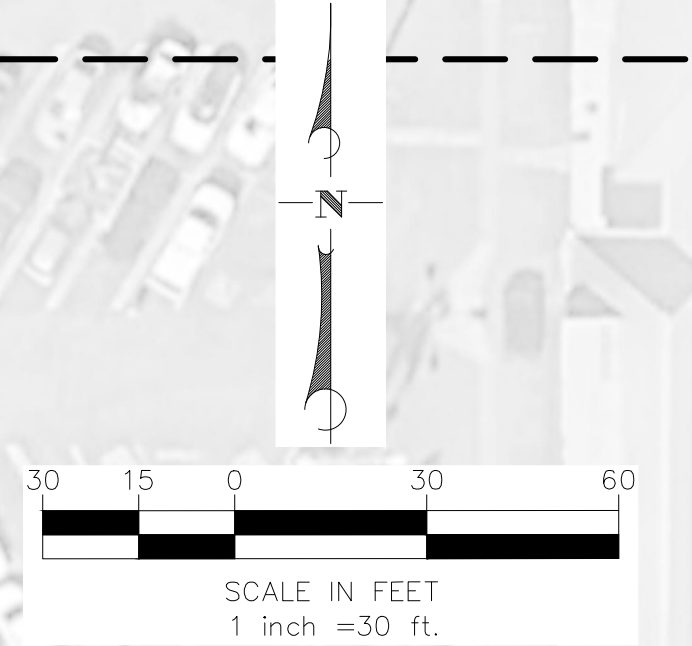
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DRAWING NAME: UTILITY MAP
PROJECT NO: 22-4939 SCALE: 1" = 30'

SHEET 8 OF 9

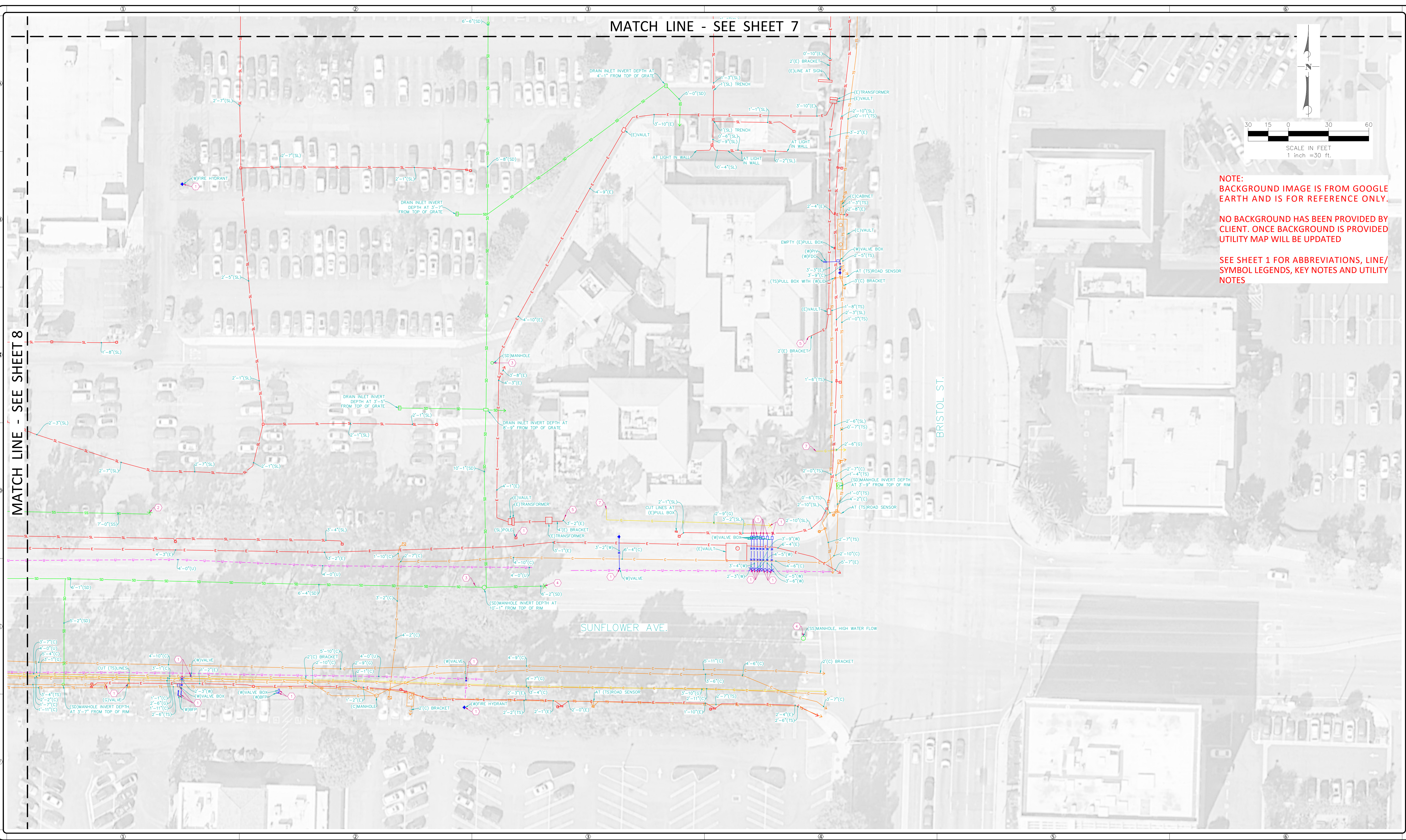
MATCH LINE - SEE SHEET 7



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NOTES



MATCH LINE - SEE SHEET 8

BRISTOL ST.

SUNFLOWER AVE.

 <p>C BELOW SUBSURFACE IMAGING</p>	<p>C BELOW SUBSURFACE IMAGING 14280 EUCLID AVE CHINO, CA 91710</p> <p>P: 888-902-3569 F: 909-606-6555 www.cbelow.com</p>	<p>NOTES: The services provided by C below, Inc. do not relieve the Client and/or property owner of the responsibility of having to comply with California Government Code §54216-4216.9. It is expressly understood by the Client and/or owner that CBSI services are not a substitute for compliance with California Code §54216-4216.9.</p>	<p>PROJECT: PARTIAL UNDERGROUND UTILITY MAP FOR: BRISTOL COMMONS W. MACARTHUR BLVD. & S. BRISTOL ST. SANTA ANA, CA 92704</p>	<p>CLIENT: FUSCOE ENGINEERING 16795 CON KARMAN, SUITE 100 IRVINE, CA 92606</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">REVISIONS</th> </tr> <tr> <th>NO</th> <th>DATE</th> <th>BY</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REVISIONS				NO	DATE	BY	DESCRIPTION													<p>DATE LOCATED: 08/2022 DRAWN BY/DATE: OG 09/06/2022 TECHNICIAN: G. DILLON CHECK BY/DATE: G. DILLON QC CHECKED BY/DATE: LB 09/30/2022 DRAWING NAME: UTILITY MAP PROJECT NO: 22-4939</p> <p style="text-align: right;">SHEET 9 OF 9 SCALE: 1" = 30'</p>
REVISIONS																										
NO	DATE	BY	DESCRIPTION																							

Appendix 13

SDMP Backup Calculations & Drainage Map (Reference Only)

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
 (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
 (c) Copyright 1983-2013 Advanced Engineering Software (aes)
 Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

***** DESCRIPTION OF STUDY *****

* SANTA ANA MPD - GARDENS WATERSHED *
 * RATIONAL METHOD HYDROLOGY MODEL *
 * 10-YEAR SEPTEMBER 2014 KCHAN REV FEB 2015 MCHANDOO *

FILE NAME: GC10.DAT
 TIME/DATE OF STUDY: 17:08 02/10/2015

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

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

USER SPECIFIED STORM EVENT(YEAR) = 10.00
 SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00
 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
 DATA BANK RAINFALL USED
 ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

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

NO.	HALF- WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT- / PARK- SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH LIP HIKE (FT) (FT) (FT)	MANNING FACTOR (n)
1	20.0	10.0	0.020/0.020/0.020	0.50	2.00 0.0312 0.125	0.0150
2	42.0	21.0	0.020/0.020/0.020	0.67	2.00 0.0312 0.167	0.0150
3	51.0	25.0	0.020/0.020/0.020	0.67	2.00 0.0312 0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

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

*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
 OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
 *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

FLOW PROCESS FROM NODE 100.00 TO NODE 101.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 108.00 DOWNSTREAM(FEET) = 106.00

$$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$$

GC10

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.586
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	1.40	0.25	0.500	69	10.99
COMMERCIAL	C	1.50	0.25	0.100	69	8.59
URBAN POOR COVER						
"TURF"	C	0.20	0.25	1.000	83	14.83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.339
 SUBAREA RUNOFF(CFS) = 8.07
 TOTAL AREA(ACRES) = 3.10 PEAK FLOW RATE(CFS) = 8.07

FLOW PROCESS FROM NODE 101.00 TO NODE 102.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 106.00 DOWNSTREAM ELEVATION(FEET) = 100.00
 STREET LENGTH(FEET) = 641.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14.77
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.43
 HALFSTREET FLOOD WIDTH(FEET) = 15.66
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.84
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.22
 STREET FLOW TRAVEL TIME(MIN.) = 3.76 Tc(MIN.) = 12.35

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.418
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	5.00	0.25	0.500	69
COMMERCIAL	C	1.40	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.413
 SUBAREA AREA(ACRES) = 6.40 SUBAREA RUNOFF(CFS) = 13.33
 EFFECTIVE AREA(ACRES) = 9.50 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.39
 TOTAL AREA(ACRES) = 9.5 PEAK FLOW RATE(CFS) = 19.84

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.47 HALFSTREET FLOOD WIDTH(FEET) = 17.62
 FLOW VELOCITY(FEET/SEC.) = 3.05 DEPTH*VELOCITY(FT*FT/SEC.) = 1.43
 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 102.00 = 971.00 FEET.

GC10

FLOW PROCESS FROM NODE 102.00 TO NODE 103.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 100.00 DOWNSTREAM ELEVATION(FEET) = 92.00
STREET LENGTH(FEET) = 1712.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 38.72
STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.62
HALFSTREET FLOOD WIDTH(FEET) = 26.03
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.93
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.82
STREET FLOW TRAVEL TIME(MIN.) = 9.73 Tc(MIN.) = 22.08
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.733

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	16.80	0.30	0.500	56
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	2.80	0.25	0.500	69
COMMERCIAL	B	4.40	0.30	0.100	56
COMMERCIAL	C	1.60	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.29
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.406
SUBAREA AREA(ACRES) = 25.60 SUBAREA RUNOFF(CFS) = 37.20
EFFECTIVE AREA(ACRES) = 35.10 AREA-AVERAGED Fm(INCH/HR) = 0.11
AREA-AVERAGED Fp(INCH/HR) = 0.28 AREA-AVERAGED Ap = 0.40
TOTAL AREA(ACRES) = 35.1 PEAK FLOW RATE(CFS) = 51.19

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.67 HALFSTREET FLOOD WIDTH(FEET) = 28.72
FLOW VELOCITY(FEET/SEC.) = 3.17 DEPTH*VELOCITY(FT*FT/SEC.) = 2.14
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 1712.0 FT WITH ELEVATION-DROP = 8.0 FT, IS 42.9 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 103.00
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 103.00 = 2683.00 FEET.

FLOW PROCESS FROM NODE 103.00 TO NODE 109.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 2 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 92.00 DOWNSTREAM ELEVATION(FEET) = 86.00
STREET LENGTH(FEET) = 2064.00 CURB HEIGHT(INCHES) = 8.0

GC10

STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 89.58

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.93

HALFSTREET FLOOD WIDTH(FEET) = 52.10

AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.64

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.46

STREET FLOW TRAVEL TIME(MIN.) = 13.05 Tc(MIN.) = 35.13

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.328

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	19.80	0.30	0.500	56
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	30.00	0.25	0.500	69
COMMERCIAL	B	7.20	0.30	0.100	56
COMMERCIAL	C	11.30	0.25	0.100	69
URBAN POOR COVER					
"TURF"	C	1.20	0.25	1.000	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.402

SUBAREA AREA(ACRES) = 69.50 SUBAREA RUNOFF(CFS) = 76.33

EFFECTIVE AREA(ACRES) = 104.60 AREA-AVERAGED Fm(INCH/HR) = 0.11

AREA-AVERAGED Fp(INCH/HR) = 0.27 AREA-AVERAGED Ap = 0.40

TOTAL AREA(ACRES) = 104.6 PEAK FLOW RATE(CFS) = 114.72

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 1.00 HALFSTREET FLOOD WIDTH(FEET) = 58.73

FLOW VELOCITY(FEET/SEC.) = 2.76 DEPTH*VELOCITY(FT*FT/SEC.) = 2.77

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 2064.0 FT WITH ELEVATION-DROP = 6.0 FT, IS 105.7 CFS,

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 109.00

LONGEST FLOWPATH FROM NODE 100.00 TO NODE 109.00 = 4747.00 FEET.

FLOW PROCESS FROM NODE 109.00 TO NODE 109.00 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.) = 35.13

RAINFALL INTENSITY(INCH/HR) = 1.33

AREA-AVERAGED Fm(INCH/HR) = 0.11

AREA-AVERAGED Fp(INCH/HR) = 0.27

AREA-AVERAGED Ap = 0.40

EFFECTIVE STREAM AREA(ACRES) = 104.60

TOTAL STREAM AREA(ACRES) = 104.60

PEAK FLOW RATE(CFS) AT CONFLUENCE = 114.72

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FLOW PROCESS FROM NODE 104.00 TO NODE 105.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 92.50 DOWNSTREAM(FEET) = 92.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.329
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.541

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	B	2.00	0.30	0.500	56	14.50
COMMERCIAL	B	0.80	0.30	0.100	56	11.33

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.386

SUBAREA RUNOFF(CFS) = 6.11

TOTAL AREA(ACRES) = 2.80 PEAK FLOW RATE(CFS) = 6.11

FLOW PROCESS FROM NODE 105.00 TO NODE 106.00 IS CODE = 62

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 92.00 DOWNSTREAM ELEVATION(FEET) = 90.00
 STREET LENGTH(FEET) = 650.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.65

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.47

HALFSTREET FLOOD WIDTH(FEET) = 17.77

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.76

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.83

STREET FLOW TRAVEL TIME(MIN.) = 6.15 Tc(MIN.) = 17.48

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.982

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	5.40	0.30	0.500	56
COMMERCIAL	B	1.20	0.30	0.100	56

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.427

SUBAREA AREA(ACRES) = 6.60 SUBAREA RUNOFF(CFS) = 11.01

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EFFECTIVE AREA(ACRES) = 9.40 AREA-AVERAGED Fm(INCH/HR) = 0.12
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.41
TOTAL AREA(ACRES) = 9.4 PEAK FLOW RATE(CFS) = 15.71

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.52 HALFSTREET FLOOD WIDTH(FEET) = 20.84
FLOW VELOCITY(FEET/SEC.) = 1.89 DEPTH*VELOCITY(FT*FT/SEC.) = 0.97
LONGEST FLOWPATH FROM NODE 104.00 TO NODE 106.00 = 980.00 FEET.

FLOW PROCESS FROM NODE 106.00 TO NODE 107.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 90.00 DOWNSTREAM ELEVATION(FEET) = 88.00

STREET LENGTH(FEET) = 712.00 CURB HEIGHT(INCHES) = 6.0

STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 26.08

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.60

HALFSTREET FLOOD WIDTH(FEET) = 24.81

AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.18

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.30

STREET FLOW TRAVEL TIME(MIN.) = 5.44 Tc(MIN.) = 22.92

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.697

SUBAREA LOSS RATE DATA(AMC II):

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

RESIDENTIAL

"5-7 DWELLINGS/ACRE" B 11.20 0.30 0.500 56

COMMERCIAL B 3.40 0.30 0.100 56

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.407

SUBAREA AREA(ACRES) = 14.60 SUBAREA RUNOFF(CFS) = 20.69

EFFECTIVE AREA(ACRES) = 24.00 AREA-AVERAGED Fm(INCH/HR) = 0.12

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.41

TOTAL AREA(ACRES) = 24.0 PEAK FLOW RATE(CFS) = 33.99

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 27.19

FLOW VELOCITY(FEET/SEC.) = 2.36 DEPTH*VELOCITY(FT*FT/SEC.) = 1.52

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 712.0 FT WITH ELEVATION-DROP = 2.0 FT, IS 28.4 CFS,

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 107.00

LONGEST FLOWPATH FROM NODE 104.00 TO NODE 107.00 = 1692.00 FEET.

FLOW PROCESS FROM NODE 107.00 TO NODE 108.00 IS CODE = 62

GC10

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<<

=====

UPSTREAM ELEVATION(FEET) =	88.00	DOWNSTREAM ELEVATION(FEET) =	87.00
STREET LENGTH(FEET) =	293.00	CURB HEIGHT(INCHES) =	6.0
STREET HALFWIDTH(FEET) =	20.00		

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 52.60
 STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) =	0.71		
HALFSTREET FLOOD WIDTH(FEET) =	30.67		
AVERAGE FLOW VELOCITY(FEET/SEC.) =	2.85		
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =	2.03		
STREET FLOW TRAVEL TIME(MIN.) =	1.71	Tc(MIN.) =	24.63

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.628

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	20.20	0.30	0.500	56
COMMERCIAL	B	7.20	0.30	0.100	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.395
 SUBAREA AREA(ACRES) = 27.40 SUBAREA RUNOFF(CFS) = 37.22
 EFFECTIVE AREA(ACRES) = 51.40 AREA-AVERAGED Fm(INCH/HR) = 0.12
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.40
 TOTAL AREA(ACRES) = 51.4 PEAK FLOW RATE(CFS) = 69.73

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.78 HALFSTREET FLOOD WIDTH(FEET) = 34.03
 FLOW VELOCITY(FEET/SEC.) = 3.06 DEPTH*VELOCITY(FT*FT/SEC.) = 2.39

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 293.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 67.7 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 108.00
 LONGEST FLOWPATH FROM NODE 104.00 TO NODE 108.00 = 1985.00 FEET.

FLOW PROCESS FROM NODE 108.00 TO NODE 109.00 IS CODE = 62

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<<

=====

UPSTREAM ELEVATION(FEET) =	87.00	DOWNSTREAM ELEVATION(FEET) =	86.00
STREET LENGTH(FEET) =	533.00	CURB HEIGHT(INCHES) =	6.0
STREET HALFWIDTH(FEET) =	20.00		

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 87.60

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.93

HALFSTREET FLOOD WIDTH(FEET) = 41.60

AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.56

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.38

STREET FLOW TRAVEL TIME(MIN.) = 3.47 Tc(MIN.) = 28.11

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.509

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	12.00	0.30	0.500	56
COMMERCIAL	B	6.10	0.30	0.100	56
URBAN POOR COVER					
"TURF"	B	4.50	0.30	1.000	74
SCHOOL	B	6.70	0.30	0.600	56

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.516

SUBAREA AREA(ACRES) = 29.30 SUBAREA RUNOFF(CFS) = 35.72

EFFECTIVE AREA(ACRES) = 80.70 AREA-AVERAGED Fm(INCH/HR) = 0.13

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.44

TOTAL AREA(ACRES) = 80.7 PEAK FLOW RATE(CFS) = 99.97

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.98 HALFSTREET FLOOD WIDTH(FEET) = 43.79

FLOW VELOCITY(FEET/SEC.) = 2.63 DEPTH*VELOCITY(FT*FT/SEC.) = 2.57

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 533.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 57.4 CFS,

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 109.00

LONGEST FLOWPATH FROM NODE 104.00 TO NODE 109.00 = 2518.00 FEET.

FLOW PROCESS FROM NODE 109.00 TO NODE 109.00 IS CODE = 1

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

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 28.11

RAINFALL INTENSITY(INCH/HR) = 1.51

AREA-AVERAGED Fm(INCH/HR) = 0.13

AREA-AVERAGED Fp(INCH/HR) = 0.30

AREA-AVERAGED Ap = 0.44

EFFECTIVE STREAM AREA(ACRES) = 80.70

TOTAL STREAM AREA(ACRES) = 80.70

PEAK FLOW RATE(CFS) AT CONFLUENCE = 99.97

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	114.72	35.13	1.328	0.27(0.11)	0.40	104.6	100.00

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2 99.97 28.11 1.509 0.30(0.13) 0.44 80.7 104.00

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	205.40	28.11	1.509	0.29(0.12)	0.42	164.4	104.00
2	201.54	35.13	1.328	0.29(0.12)	0.42	185.3	100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 205.40 Tc(MIN.) = 28.11
 EFFECTIVE AREA(ACRES) = 164.39 AREA-AVERAGED Fm(INCH/HR) = 0.12
 AREA-AVERAGED Fp(INCH/HR) = 0.29 AREA-AVERAGED Ap = 0.42
 TOTAL AREA(ACRES) = 185.3
 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 109.00 = 4747.00 FEET.

 FLOW PROCESS FROM NODE 109.00 TO NODE 115.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 86.00 DOWNSTREAM(FEET) = 85.50
 FLOW LENGTH(FEET) = 1021.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 102.0 INCH PIPE IS 76.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 4.50
 ESTIMATED PIPE DIAMETER(INCH) = 102.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 205.40
 PIPE TRAVEL TIME(MIN.) = 3.78 Tc(MIN.) = 31.89
 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 115.00 = 5768.00 FEET.

 FLOW PROCESS FROM NODE 115.00 TO NODE 115.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION(MIN.) = 31.89
 RAINFALL INTENSITY(INCH/HR) = 1.40
 AREA-AVERAGED Fm(INCH/HR) = 0.12
 AREA-AVERAGED Fp(INCH/HR) = 0.29
 AREA-AVERAGED Ap = 0.42
 EFFECTIVE STREAM AREA(ACRES) = 164.39
 TOTAL STREAM AREA(ACRES) = 185.30
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 205.40

 FLOW PROCESS FROM NODE 112.00 TO NODE 113.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 281.00
 ELEVATION DATA: UPSTREAM(FEET) = 103.00 DOWNSTREAM(FEET) = 102.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.956

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* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.907

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	0.90	0.25	0.500	69	11.46
COMMERCIAL	C	1.10	0.25	0.100	69	8.96
NATURAL FAIR COVER						
"OPEN BRUSH"	C	0.10	0.25	1.000	77	20.80

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.314
SUBAREA RUNOFF(CFS) = 5.35
TOTAL AREA(ACRES) = 2.10 PEAK FLOW RATE(CFS) = 5.35

FLOW PROCESS FROM NODE 113.00 TO NODE 114.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 3 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 103.00 DOWNSTREAM ELEVATION(FEET) = 96.00
STREET LENGTH(FEET) = 1341.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 51.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 25.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 19.40
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.55
HALFSTREET FLOOD WIDTH(FEET) = 19.48
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.43
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.33
STREET FLOW TRAVEL TIME(MIN.) = 9.19 Tc(MIN.) = 18.14
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.940

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	12.10	0.30	0.500	56
COMMERCIAL	C	4.60	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.390
SUBAREA AREA(ACRES) = 16.70 SUBAREA RUNOFF(CFS) = 27.42
EFFECTIVE AREA(ACRES) = 18.80 AREA-AVERAGED Fm(INCH/HR) = 0.11
AREA-AVERAGED Fp(INCH/HR) = 0.29 AREA-AVERAGED Ap = 0.38
TOTAL AREA(ACRES) = 18.8 PEAK FLOW RATE(CFS) = 30.94

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.63 HALFSTREET FLOOD WIDTH(FEET) = 23.42
FLOW VELOCITY(FEET/SEC.) = 2.73 DEPTH*VELOCITY(FT*FT/SEC.) = 1.71
LONGEST FLOWPATH FROM NODE 112.00 TO NODE 114.00 = 1622.00 FEET.

GC10

FLOW PROCESS FROM NODE 114.00 TO NODE 115.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 96.00 DOWNSTREAM ELEVATION(FEET) = 85.50
STREET LENGTH(FEET) = 2539.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 68.63
STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.75
HALFSTREET FLOOD WIDTH(FEET) = 32.68
AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.27
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.46
STREET FLOW TRAVEL TIME(MIN.) = 12.95 Tc(MIN.) = 31.09
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.425

SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Rows include Residential, Commercial, and School categories.

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.371
SUBAREA AREA(ACRES) = 62.50 SUBAREA RUNOFF(CFS) = 74.50
EFFECTIVE AREA(ACRES) = 81.30 AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.28 AREA-AVERAGED Ap = 0.37
TOTAL AREA(ACRES) = 81.3 PEAK FLOW RATE(CFS) = 96.72

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.84 HALFSTREET FLOOD WIDTH(FEET) = 37.14
FLOW VELOCITY(FEET/SEC.) = 3.55 DEPTH*VELOCITY(FT*FT/SEC.) = 2.99
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 2539.0 FT WITH ELEVATION-DROP = 10.5 FT, IS 94.8 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 115.00
LONGEST FLOWPATH FROM NODE 112.00 TO NODE 115.00 = 4161.00 FEET.

FLOW PROCESS FROM NODE 115.00 TO NODE 115.00 IS CODE = 1

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

GC10

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 31.09
 RAINFALL INTENSITY(INCH/HR) = 1.42
 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.28
 AREA-AVERAGED Ap = 0.37
 EFFECTIVE STREAM AREA(ACRES) = 81.30
 TOTAL STREAM AREA(ACRES) = 81.30
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 96.72

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	205.40	31.89	1.404	0.29(0.12)	0.42	164.4	104.00
1	201.54	38.92	1.253	0.29(0.12)	0.42	185.3	100.00
2	96.72	31.09	1.425	0.28(0.10)	0.37	81.3	112.00

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	300.19	31.09	1.425	0.28(0.11)	0.41	241.6	112.00
2	300.62	31.89	1.404	0.28(0.12)	0.41	245.7	104.00
3	285.68	38.92	1.253	0.28(0.11)	0.41	266.6	100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 300.62 Tc(MIN.) = 31.89
 EFFECTIVE AREA(ACRES) = 245.69 AREA-AVERAGED Fm(INCH/HR) = 0.12
 AREA-AVERAGED Fp(INCH/HR) = 0.28 AREA-AVERAGED Ap = 0.41
 TOTAL AREA(ACRES) = 266.6
 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 115.00 = 5768.00 FEET.

FLOW PROCESS FROM NODE 115.00 TO NODE 120.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 85.50 DOWNSTREAM(FEET) = 85.00
 FLOW LENGTH(FEET) = 473.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 102.0 INCH PIPE IS 76.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.60
 ESTIMATED PIPE DIAMETER(INCH) = 102.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 300.62
 PIPE TRAVEL TIME(MIN.) = 1.19 Tc(MIN.) = 33.08
 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 120.00 = 6241.00 FEET.

FLOW PROCESS FROM NODE 120.00 TO NODE 120.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION(MIN.) = 33.08
 RAINFALL INTENSITY(INCH/HR) = 1.37
 AREA-AVERAGED Fm(INCH/HR) = 0.12

GC10

AREA-AVERAGED Fp(INCH/HR) = 0.28
 AREA-AVERAGED Ap = 0.41
 EFFECTIVE STREAM AREA(ACRES) = 245.69
 TOTAL STREAM AREA(ACRES) = 266.60
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 300.62

 FLOW PROCESS FROM NODE 116.00 TO NODE 117.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) =	330.00
ELEVATION DATA: UPSTREAM(FEET) =	88.50
DOWNSTREAM(FEET) =	88.00

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

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.329

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.541

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	B	1.70	0.30	0.500	56	14.50
COMMERCIAL	B	0.30	0.30	0.100	56	11.33
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30						
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.440						
SUBAREA RUNOFF(CFS) = 4.34						
TOTAL AREA(ACRES) = 2.00 PEAK FLOW RATE(CFS) = 4.34						

FLOW PROCESS FROM NODE 117.00 TO NODE 118.00 IS CODE = 62

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) =	88.00	DOWNSTREAM ELEVATION(FEET) =	87.00
STREET LENGTH(FEET) =	506.00	CURB HEIGHT(INCHES) =	6.0
STREET HALFWIDTH(FEET) =	20.00		

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.76

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.45

HALFSTREET FLOOD WIDTH(FEET) = 16.52

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.35

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.60

STREET FLOW TRAVEL TIME(MIN.) = 6.25 Tc(MIN.) = 17.58

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.975

SUBAREA LOSS RATE DATA(AMC II):

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

GC10

"5-7 DWELLINGS/ACRE" B 3.40 0.30 0.500 56
 COMMERCIAL B 0.70 0.30 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.432
 SUBAREA AREA(ACRES) = 4.10 SUBAREA RUNOFF(CFS) = 6.81
 EFFECTIVE AREA(ACRES) = 6.10 AREA-AVERAGED Fm(INCH/HR) = 0.13
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.43
 TOTAL AREA(ACRES) = 6.1 PEAK FLOW RATE(CFS) = 10.13

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 18.40
 FLOW VELOCITY(FEET/SEC.) = 1.43 DEPTH*VELOCITY(FT*FT/SEC.) = 0.69
 LONGEST FLOWPATH FROM NODE 116.00 TO NODE 118.00 = 836.00 FEET.

FLOW PROCESS FROM NODE 118.00 TO NODE 119.00 IS CODE = 62

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<<

=====

UPSTREAM ELEVATION(FEET) = 87.00 DOWNSTREAM ELEVATION(FEET) = 86.00
 STREET LENGTH(FEET) = 545.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.46
 STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.56
 HALFSTREET FLOOD WIDTH(FEET) = 22.86
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.63
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.91
 STREET FLOW TRAVEL TIME(MIN.) = 5.57 Tc(MIN.) = 23.15
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.687

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	7.30	0.30	0.500	56
COMMERCIAL	B	1.70	0.30	0.100	56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.424					
SUBAREA AREA(ACRES) = 9.00 SUBAREA RUNOFF(CFS) = 12.63					
EFFECTIVE AREA(ACRES) = 15.10 AREA-AVERAGED Fm(INCH/HR) = 0.13					
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.43					
TOTAL AREA(ACRES) = 15.1 PEAK FLOW RATE(CFS) = 21.18					

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.60 HALFSTREET FLOOD WIDTH(FEET) = 24.87
 FLOW VELOCITY(FEET/SEC.) = 1.76 DEPTH*VELOCITY(FT*FT/SEC.) = 1.05
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 545.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 17.7 CFS,

GC10

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 119.00
 LONGEST FLOWPATH FROM NODE 116.00 TO NODE 119.00 = 1381.00 FEET.

 FLOW PROCESS FROM NODE 119.00 TO NODE 120.00 IS CODE = 62

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 86.00 DOWNSTREAM ELEVATION(FEET) = 85.00
 STREET LENGTH(FEET) = 662.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 32.20
 STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.70
 HALFSTREET FLOOD WIDTH(FEET) = 29.75
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.86
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.29
 STREET FLOW TRAVEL TIME(MIN.) = 5.95 Tc(MIN.) = 29.10
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.480

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	12.90	0.30	0.500	56
COMMERCIAL	B	4.80	0.30	0.100	56
URBAN POOR COVER					
"TURF"	B	0.30	0.30	1.000	74

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.402
 SUBAREA AREA(ACRES) = 18.00 SUBAREA RUNOFF(CFS) = 22.02
 EFFECTIVE AREA(ACRES) = 33.10 AREA-AVERAGED Fm(INCH/HR) = 0.12
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.41
 TOTAL AREA(ACRES) = 33.1 PEAK FLOW RATE(CFS) = 40.38

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.75 HALFSTREET FLOOD WIDTH(FEET) = 32.32
 FLOW VELOCITY(FEET/SEC.) = 1.97 DEPTH*VELOCITY(FT*FT/SEC.) = 1.47
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 662.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 33.1 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 120.00
 LONGEST FLOWPATH FROM NODE 116.00 TO NODE 120.00 = 2043.00 FEET.

 FLOW PROCESS FROM NODE 120.00 TO NODE 120.00 IS CODE = 1

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

GC10

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 29.10
 RAINFALL INTENSITY(INCH/HR) = 1.48
 AREA-AVERAGED Fm(INCH/HR) = 0.12
 AREA-AVERAGED Fp(INCH/HR) = 0.30
 AREA-AVERAGED Ap = 0.41
 EFFECTIVE STREAM AREA(ACRES) = 33.10
 TOTAL STREAM AREA(ACRES) = 33.10
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 40.38

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	300.19	32.29	1.394	0.28(0.11)	0.41	241.6	112.00
1	300.62	33.08	1.375	0.28(0.12)	0.41	245.7	104.00
1	285.68	40.12	1.231	0.28(0.11)	0.41	266.6	100.00
2	40.38	29.10	1.480	0.30(0.12)	0.41	33.1	116.00

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	329.03	29.10	1.480	0.29(0.12)	0.41	250.8	116.00
2	338.02	32.29	1.394	0.29(0.12)	0.41	274.7	112.00
3	337.88	33.08	1.375	0.29(0.12)	0.41	278.8	104.00
4	318.65	40.12	1.231	0.28(0.12)	0.41	299.7	100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 338.02 Tc(MIN.) = 32.29
 EFFECTIVE AREA(ACRES) = 274.69 AREA-AVERAGED Fm(INCH/HR) = 0.12
 AREA-AVERAGED Fp(INCH/HR) = 0.29 AREA-AVERAGED Ap = 0.41
 TOTAL AREA(ACRES) = 299.7
 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 120.00 = 6241.00 FEET.

FLOW PROCESS FROM NODE 120.00 TO NODE 127.00 IS CODE = 31

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

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 85.00 DOWNSTREAM(FEET) = 78.00

FLOW LENGTH(FEET) = 1464.00 MANNING'S N = 0.013

DEPTH OF FLOW IN 78.0 INCH PIPE IS 62.8 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 11.81

ESTIMATED PIPE DIAMETER(INCH) = 78.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) = 338.02

PIPE TRAVEL TIME(MIN.) = 2.07 Tc(MIN.) = 34.35

LONGEST FLOWPATH FROM NODE 100.00 TO NODE 127.00 = 7705.00 FEET.

FLOW PROCESS FROM NODE 127.00 TO NODE 127.00 IS CODE = 10

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

=====

FLOW PROCESS FROM NODE 121.00 TO NODE 122.00 IS CODE = 21

GC10

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 96.50 DOWNSTREAM(FEET) = 96.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.329
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.541

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	C	0.70	0.25	0.100	69	11.33
SCHOOL	C	0.70	0.25	0.600	69	15.35

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350

SUBAREA RUNOFF(CFS) = 3.09

TOTAL AREA(ACRES) = 1.40 PEAK FLOW RATE(CFS) = 3.09

FLOW PROCESS FROM NODE 122.00 TO NODE 123.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 2 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 96.00 DOWNSTREAM ELEVATION(FEET) = 94.00
 STREET LENGTH(FEET) = 439.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.11

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.41

HALFSTREET FLOOD WIDTH(FEET) = 12.43

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.76

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.72

STREET FLOW TRAVEL TIME(MIN.) = 4.15 Tc(MIN.) = 15.48

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.125

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	1.10	0.25	0.500	69
COMMERCIAL	C	1.20	0.25	0.100	69
SCHOOL	C	1.00	0.25	0.600	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.385

SUBAREA AREA(ACRES) = 3.30 SUBAREA RUNOFF(CFS) = 6.02

EFFECTIVE AREA(ACRES) = 4.70 AREA-AVERAGED Fm(INCH/HR) = 0.09

AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.37

TOTAL AREA(ACRES) = 4.7 PEAK FLOW RATE(CFS) = 8.59

GC10

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.45 HALFSTREET FLOOD WIDTH(FEET) = 14.36
 FLOW VELOCITY(FEET/SEC.) = 1.91 DEPTH*VELOCITY(FT*FT/SEC.) = 0.85
 LONGEST FLOWPATH FROM NODE 121.00 TO NODE 123.00 = 769.00 FEET.

FLOW PROCESS FROM NODE 123.00 TO NODE 124.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 2 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 94.00 DOWNSTREAM ELEVATION(FEET) = 90.00
 STREET LENGTH(FEET) = 870.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 13.28

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.50
 HALFSTREET FLOOD WIDTH(FEET) = 17.18
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.12
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.06
 STREET FLOW TRAVEL TIME(MIN.) = 6.86 Tc(MIN.) = 22.33
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.722

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	3.30	0.25	0.500	69
COMMERCIAL	C	2.00	0.25	0.100	69
SCHOOL	C	1.10	0.25	0.600	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.392
 SUBAREA AREA(ACRES) = 6.40 SUBAREA RUNOFF(CFS) = 9.35
 EFFECTIVE AREA(ACRES) = 11.10 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.38
 TOTAL AREA(ACRES) = 11.1 PEAK FLOW RATE(CFS) = 16.24

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.53 HALFSTREET FLOOD WIDTH(FEET) = 18.59
 FLOW VELOCITY(FEET/SEC.) = 2.23 DEPTH*VELOCITY(FT*FT/SEC.) = 1.18
 LONGEST FLOWPATH FROM NODE 121.00 TO NODE 124.00 = 1639.00 FEET.

FLOW PROCESS FROM NODE 124.00 TO NODE 125.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 2 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 90.00 DOWNSTREAM ELEVATION(FEET) = 85.00
 STREET LENGTH(FEET) = 967.00 CURB HEIGHT(INCHES) = 8.0

GC10

STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25.40

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.59

HALFSTREET FLOOD WIDTH(FEET) = 21.70

AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.59

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.54

STREET FLOW TRAVEL TIME(MIN.) = 6.21 Tc(MIN.) = 28.55

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.496

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	8.50	0.25	0.500	69
COMMERCIAL	C	4.80	0.25	0.100	69
SCHOOL	C	1.20	0.25	0.600	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.376

SUBAREA AREA(ACRES) = 14.50 SUBAREA RUNOFF(CFS) = 18.30

EFFECTIVE AREA(ACRES) = 25.60 AREA-AVERAGED Fm(INCH/HR) = 0.09

AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.38

TOTAL AREA(ACRES) = 25.6 PEAK FLOW RATE(CFS) = 32.28

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.63 HALFSTREET FLOOD WIDTH(FEET) = 23.83

FLOW VELOCITY(FEET/SEC.) = 2.75 DEPTH*VELOCITY(FT*FT/SEC.) = 1.75

LONGEST FLOWPATH FROM NODE 121.00 TO NODE 125.00 = 2606.00 FEET.

FLOW PROCESS FROM NODE 125.00 TO NODE 126.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 2 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 85.00 DOWNSTREAM ELEVATION(FEET) = 82.00

STREET LENGTH(FEET) = 452.00 CURB HEIGHT(INCHES) = 8.0

STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 46.76

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.68

GC10

HALFSTREET FLOOD WIDTH(FEET) = 27.00
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.31
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.26
 STREET FLOW TRAVEL TIME(MIN.) = 2.28 Tc(MIN.) = 30.82
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.432
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	11.70	0.25	0.500	69
COMMERCIAL	C	12.00	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.297
 SUBAREA AREA(ACRES) = 23.70 SUBAREA RUNOFF(CFS) = 28.95
 EFFECTIVE AREA(ACRES) = 49.30 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.34
 TOTAL AREA(ACRES) = 49.3 PEAK FLOW RATE(CFS) = 59.75

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.73 HALFSTREET FLOOD WIDTH(FEET) = 32.08
 FLOW VELOCITY(FEET/SEC.) = 3.49 DEPTH*VELOCITY(FT*FT/SEC.) = 2.56
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 452.0 FT WITH ELEVATION-DROP = 3.0 FT, IS 58.1 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 126.00
 LONGEST FLOWPATH FROM NODE 121.00 TO NODE 126.00 = 3058.00 FEET.

 FLOW PROCESS FROM NODE 126.00 TO NODE 126.50 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 82.00 DOWNSTREAM(FEET) = 80.00
 FLOW LENGTH(FEET) = 847.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 48.0 INCH PIPE IS 35.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 5.97
 ESTIMATED PIPE DIAMETER(INCH) = 48.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 59.75
 PIPE TRAVEL TIME(MIN.) = 2.37 Tc(MIN.) = 33.19
 LONGEST FLOWPATH FROM NODE 121.00 TO NODE 126.50 = 3905.00 FEET.

 FLOW PROCESS FROM NODE 126.50 TO NODE 126.50 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION(MIN.) = 33.19
 RAINFALL INTENSITY(INCH/HR) = 1.37
 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.34
 EFFECTIVE STREAM AREA(ACRES) = 49.30
 TOTAL STREAM AREA(ACRES) = 49.30
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 59.75

 FLOW PROCESS FROM NODE 126.10 TO NODE 126.20 IS CODE = 21

GC10

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 85.00 DOWNSTREAM(FEET) = 84.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.862
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751

SUBAREA Tc AND LOSS RATE DATA(AMC II):

Table with 7 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN, Tc (MIN.). Rows include RESIDENTIAL, '5-7 DWELLINGS/ACRE', COMMERCIAL, URBAN POOR COVER, and 'TURF'.

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.628

SUBAREA RUNOFF(CFS) = 4.20

TOTAL AREA(ACRES) = 1.80 PEAK FLOW RATE(CFS) = 4.20

FLOW PROCESS FROM NODE 126.20 TO NODE 126.30 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 84.00 DOWNSTREAM ELEVATION(FEET) = 82.00
STREET LENGTH(FEET) = 625.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8.47

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.43

HALFSTREET FLOOD WIDTH(FEET) = 15.51

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.66

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.71

STREET FLOW TRAVEL TIME(MIN.) = 6.28 Tc(MIN.) = 16.14

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.074

SUBAREA LOSS RATE DATA(AMC II):

Table with 7 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Rows include RESIDENTIAL, '5-7 DWELLINGS/ACRE', COMMERCIAL, URBAN POOR COVER, and 'TURF'.

GC10

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.28
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.557
SUBAREA AREA(ACRES) = 4.90 SUBAREA RUNOFF(CFS) = 8.46
EFFECTIVE AREA(ACRES) = 6.70 AREA-AVERAGED Fm(INCH/HR) = 0.16
AREA-AVERAGED Fp(INCH/HR) = 0.27 AREA-AVERAGED Ap = 0.58
TOTAL AREA(ACRES) = 6.7 PEAK FLOW RATE(CFS) = 11.57

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.47 HALFSTREET FLOOD WIDTH(FEET) = 17.62
FLOW VELOCITY(FEET/SEC.) = 1.78 DEPTH*VELOCITY(FT*FT/SEC.) = 0.83
LONGEST FLOWPATH FROM NODE 126.10 TO NODE 126.30 = 955.00 FEET.

FLOW PROCESS FROM NODE 126.30 TO NODE 126.40 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 82.00 DOWNSTREAM ELEVATION(FEET) = 81.00
STREET LENGTH(FEET) = 292.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.30

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.53
HALFSTREET FLOOD WIDTH(FEET) = 21.45
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.07
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.09
STREET FLOW TRAVEL TIME(MIN.) = 2.35 Tc(MIN.) = 18.49

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.919

SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Rows include Residential (5-7 dwellings/acre), Commercial (B and C).

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.288
SUBAREA AREA(ACRES) = 8.10 SUBAREA RUNOFF(CFS) = 13.46
EFFECTIVE AREA(ACRES) = 14.80 AREA-AVERAGED Fm(INCH/HR) = 0.11
AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.42
TOTAL AREA(ACRES) = 14.8 PEAK FLOW RATE(CFS) = 24.09

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.57 HALFSTREET FLOOD WIDTH(FEET) = 23.41
FLOW VELOCITY(FEET/SEC.) = 2.27 DEPTH*VELOCITY(FT*FT/SEC.) = 1.29

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 292.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 20.4 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 126.40

GC10

LONGEST FLOWPATH FROM NODE 126.10 TO NODE 126.40 = 1247.00 FEET.

FLOW PROCESS FROM NODE 126.40 TO NODE 126.50 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 81.00 DOWNSTREAM ELEVATION(FEET) = 80.00
STREET LENGTH(FEET) = 449.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 34.17

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.67
HALFSTREET FLOOD WIDTH(FEET) = 28.35
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.17
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.45
STREET FLOW TRAVEL TIME(MIN.) = 3.44 Tc(MIN.) = 21.94
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.740

SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Rows include Residential, Commercial, and Commercial.

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.223
SUBAREA AREA(ACRES) = 13.30 SUBAREA RUNOFF(CFS) = 20.15
EFFECTIVE AREA(ACRES) = 28.10 AREA-AVERAGED Fm(INCH/HR) = 0.08
AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.33
TOTAL AREA(ACRES) = 28.1 PEAK FLOW RATE(CFS) = 41.85

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.71 HALFSTREET FLOOD WIDTH(FEET) = 30.49
FLOW VELOCITY(FEET/SEC.) = 2.30 DEPTH*VELOCITY(FT*FT/SEC.) = 1.63

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 449.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 28.9 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 126.50
LONGEST FLOWPATH FROM NODE 126.10 TO NODE 126.50 = 1696.00 FEET.

FLOW PROCESS FROM NODE 126.50 TO NODE 126.50 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:

GC10

TIME OF CONCENTRATION(MIN.) = 21.94
 RAINFALL INTENSITY(INCH/HR) = 1.74
 AREA-AVERAGED Fm(INCH/HR) = 0.08
 AREA-AVERAGED Fp(INCH/HR) = 0.26
 AREA-AVERAGED Ap = 0.33
 EFFECTIVE STREAM AREA(ACRES) = 28.10
 TOTAL STREAM AREA(ACRES) = 28.10
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 41.85

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	59.75	33.19	1.372	0.25(0.09)	0.34	49.3	121.00
2	41.85	21.94	1.740	0.26(0.08)	0.33	28.1	126.10

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	92.62	21.94	1.740	0.25(0.08)	0.33	60.7	126.10
2	92.31	33.19	1.372	0.25(0.08)	0.34	77.4	121.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 92.62 Tc(MIN.) = 21.94
 EFFECTIVE AREA(ACRES) = 60.68 AREA-AVERAGED Fm(INCH/HR) = 0.08
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.33
 TOTAL AREA(ACRES) = 77.4
 LONGEST FLOWPATH FROM NODE 121.00 TO NODE 126.50 = 3905.00 FEET.

FLOW PROCESS FROM NODE 126.50 TO NODE 127.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 80.00 DOWNSTREAM(FEET) = 78.00
 FLOW LENGTH(FEET) = 889.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 57.0 INCH PIPE IS 42.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.53
 ESTIMATED PIPE DIAMETER(INCH) = 57.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 92.62
 PIPE TRAVEL TIME(MIN.) = 2.27 Tc(MIN.) = 24.20
 LONGEST FLOWPATH FROM NODE 121.00 TO NODE 127.00 = 4794.00 FEET.

FLOW PROCESS FROM NODE 127.00 TO NODE 127.00 IS CODE = 11

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

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	92.62	24.20	1.644	0.25(0.08)	0.33	60.7	126.10
2	92.31	35.46	1.321	0.25(0.08)	0.34	77.4	121.00

LONGEST FLOWPATH FROM NODE 121.00 TO NODE 127.00 = 4794.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

GC10

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	329.03	31.17	1.423	0.29(0.12)	0.41	250.8	116.00
2	338.02	34.35	1.345	0.29(0.12)	0.41	274.7	112.00
3	337.88	35.15	1.328	0.29(0.12)	0.41	278.8	104.00
4	318.65	42.20	1.196	0.28(0.12)	0.41	299.7	100.00

LONGEST FLOWPATH FROM NODE 100.00 TO NODE 127.00 = 7705.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	391.52	24.20	1.644	0.28(0.11)	0.39	255.5	126.10
2	421.46	31.17	1.423	0.28(0.11)	0.39	321.9	116.00
3	430.36	34.35	1.345	0.28(0.11)	0.39	350.5	112.00
4	430.20	35.15	1.328	0.28(0.11)	0.39	355.7	104.00
5	429.34	35.46	1.321	0.28(0.11)	0.39	357.1	121.00
6	401.61	42.20	1.196	0.28(0.11)	0.39	377.1	100.00

TOTAL AREA(ACRES) = 377.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 430.36 Tc(MIN.) = 34.354
 EFFECTIVE AREA(ACRES) = 350.45 AREA-AVERAGED Fm(INCH/HR) = 0.11
 AREA-AVERAGED Fp(INCH/HR) = 0.28 AREA-AVERAGED Ap = 0.39
 TOTAL AREA(ACRES) = 377.1
 LONGEST FLOWPATH FROM NODE 100.00 TO NODE 127.00 = 7705.00 FEET.

 FLOW PROCESS FROM NODE 127.00 TO NODE 127.00 IS CODE = 12

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

 FLOW PROCESS FROM NODE 127.00 TO NODE 127.00 IS CODE = 1

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

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION(MIN.) = 34.35
 RAINFALL INTENSITY(INCH/HR) = 1.35
 AREA-AVERAGED Fm(INCH/HR) = 0.11
 AREA-AVERAGED Fp(INCH/HR) = 0.28
 AREA-AVERAGED Ap = 0.39
 EFFECTIVE STREAM AREA(ACRES) = 350.45
 TOTAL STREAM AREA(ACRES) = 377.10
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 430.36

 FLOW PROCESS FROM NODE 126.60 TO NODE 126.70 IS CODE = 21

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 80.00 DOWNSTREAM(FEET) = 79.50

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.329
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.541

GC10

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	B	9.20	0.30	0.100	56	11.33

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 20.79
 TOTAL AREA(ACRES) = 9.20 PEAK FLOW RATE(CFS) = 20.79

FLOW PROCESS FROM NODE 126.70 TO NODE 126.80 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 2 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 79.50 DOWNSTREAM ELEVATION(FEET) = 79.00
 STREET LENGTH(FEET) = 350.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 30.83
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.76
 HALFSTREET FLOOD WIDTH(FEET) = 34.54
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.64
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.24
 STREET FLOW TRAVEL TIME(MIN.) = 3.55 Tc(MIN.) = 14.88
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.173

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	10.40	0.30	0.100	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 10.40 SUBAREA RUNOFF(CFS) = 20.06
 EFFECTIVE AREA(ACRES) = 19.60 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.10
 TOTAL AREA(ACRES) = 19.6 PEAK FLOW RATE(CFS) = 37.80

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.80 HALFSTREET FLOOD WIDTH(FEET) = 39.14
 FLOW VELOCITY(FEET/SEC.) = 1.71 DEPTH*VELOCITY(FT*FT/SEC.) = 1.37
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 350.0 FT WITH ELEVATION-DROP = 0.5 FT, IS 23.0 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 126.80
 LONGEST FLOWPATH FROM NODE 126.60 TO NODE 126.80 = 680.00 FEET.

FLOW PROCESS FROM NODE 126.80 TO NODE 127.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 2 USED)<<<<<

GC10

=====

UPSTREAM ELEVATION(FEET) = 79.00 DOWNSTREAM ELEVATION(FEET) = 78.00
 STREET LENGTH(FEET) = 461.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 62.38
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.88
 HALFSTREET FLOOD WIDTH(FEET) = 46.36
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.20
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.93
 STREET FLOW TRAVEL TIME(MIN.) = 3.49 Tc(MIN.) = 18.37
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.926

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	26.90	0.30	0.100	56
URBAN POOR COVER "TURF"	B	2.20	0.30	1.000	74

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.168
 SUBAREA AREA(ACRES) = 29.10 SUBAREA RUNOFF(CFS) = 49.12
 EFFECTIVE AREA(ACRES) = 48.70 AREA-AVERAGED Fm(INCH/HR) = 0.04
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.14
 TOTAL AREA(ACRES) = 48.7 PEAK FLOW RATE(CFS) = 82.56

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.95 HALFSTREET FLOOD WIDTH(FEET) = 53.74
 FLOW VELOCITY(FEET/SEC.) = 2.31 DEPTH*VELOCITY(FT*FT/SEC.) = 2.20
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 461.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 62.9 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 127.00
 LONGEST FLOWPATH FROM NODE 126.60 TO NODE 127.00 = 1141.00 FEET.

FLOW PROCESS FROM NODE 127.00 TO NODE 127.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 18.37
 RAINFALL INTENSITY(INCH/HR) = 1.93
 AREA-AVERAGED Fm(INCH/HR) = 0.04
 AREA-AVERAGED Fp(INCH/HR) = 0.30
 AREA-AVERAGED Ap = 0.14
 EFFECTIVE STREAM AREA(ACRES) = 48.70
 TOTAL STREAM AREA(ACRES) = 48.70
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 82.56

GC10

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	391.52	24.20	1.644	0.28(0.11)	0.39	255.5	126.10
1	421.46	31.17	1.423	0.28(0.11)	0.39	321.9	116.00
1	430.36	34.35	1.345	0.28(0.11)	0.39	350.5	112.00
1	430.20	35.15	1.328	0.28(0.11)	0.39	355.7	104.00
1	429.34	35.46	1.321	0.28(0.11)	0.39	357.1	121.00
1	401.61	42.20	1.196	0.28(0.11)	0.39	377.1	100.00
2	82.56	18.37	1.926	0.30(0.04)	0.14	48.7	126.60

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	434.19	18.37	1.926	0.28(0.10)	0.34	242.6	126.60
2	461.74	24.20	1.644	0.28(0.10)	0.35	304.2	126.10
3	481.96	31.17	1.423	0.28(0.10)	0.36	370.6	116.00
4	487.49	34.35	1.345	0.28(0.10)	0.36	399.2	112.00
5	486.55	35.15	1.328	0.28(0.10)	0.36	404.4	104.00
6	485.40	35.46	1.321	0.28(0.10)	0.36	405.8	121.00
7	452.18	42.20	1.196	0.28(0.10)	0.36	425.8	100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 487.49 Tc(MIN.) = 34.35
EFFECTIVE AREA(ACRES) = 399.15 AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.28 AREA-AVERAGED Ap = 0.36
TOTAL AREA(ACRES) = 425.8
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 127.00 = 7705.00 FEET.

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| END OF SYSTEM |
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FLOW PROCESS FROM NODE 128.00 TO NODE 129.00 IS CODE = 21

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

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00

ELEVATION DATA: UPSTREAM(FEET) = 78.50 DOWNSTREAM(FEET) = 78.00

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.329

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.541

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.)
APARTMENTS	B	7.90	0.30	0.200	56	12.07
COMMERCIAL	B	0.20	0.30	0.100	56	11.33
URBAN POOR COVER "TURF"	B	0.10	0.30	1.000	74	19.56

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.207

SUBAREA RUNOFF(CFS) = 18.29

GC10
TOTAL AREA(ACRES) = 8.20 PEAK FLOW RATE(CFS) = 18.29

FLOW PROCESS FROM NODE 129.00 TO NODE 130.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 78.00 DOWNSTREAM ELEVATION(FEET) = 75.00
STREET LENGTH(FEET) = 525.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 29.08

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.56

HALFSTREET FLOOD WIDTH(FEET) = 22.92

AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.86

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.60

STREET FLOW TRAVEL TIME(MIN.) = 3.05 Tc(MIN.) = 14.38

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.216

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
APARTMENTS	B	10.80	0.30	0.200	56
COMMERCIAL	B	0.20	0.30	0.100	56
URBAN POOR COVER "TURF"	B	0.10	0.30	1.000	74

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.205

SUBAREA AREA(ACRES) = 11.10 SUBAREA RUNOFF(CFS) = 21.52

EFFECTIVE AREA(ACRES) = 19.30 AREA-AVERAGED Fm(INCH/HR) = 0.06

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.21

TOTAL AREA(ACRES) = 19.3 PEAK FLOW RATE(CFS) = 37.41

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.60 HALFSTREET FLOOD WIDTH(FEET) = 24.87

FLOW VELOCITY(FEET/SEC.) = 3.11 DEPTH*VELOCITY(FT*FT/SEC.) = 1.86

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 525.0 FT WITH ELEVATION-DROP = 3.0 FT, IS 26.0 CFS,

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 130.00

LONGEST FLOWPATH FROM NODE 128.00 TO NODE 130.00 = 855.00 FEET.

FLOW PROCESS FROM NODE 130.00 TO NODE 130.50 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 75.00 DOWNSTREAM ELEVATION(FEET) = 74.00
STREET LENGTH(FEET) = 837.00 CURB HEIGHT(INCHES) = 6.0

GC10

STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 47.12

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.82

HALFSTREET FLOOD WIDTH(FEET) = 35.80

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.86

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.52

STREET FLOW TRAVEL TIME(MIN.) = 7.48 Tc(MIN.) = 21.87

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.743

SUBAREA LOSS RATE DATA(AMC II):

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

"5-7 DWELLINGS/ACRE"	B	0.10	0.30	0.500	56
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APARTMENTS	B	12.40	0.30	0.200	56
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COMMERCIAL	B	0.10	0.30	0.100	56
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URBAN POOR COVER

"TURF"	B	0.10	0.30	1.000	74
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SCHOOL	B	0.10	0.30	0.600	56
--------	---	------	------	-------	----

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.211

SUBAREA AREA(ACRES) = 12.80 SUBAREA RUNOFF(CFS) = 19.35

EFFECTIVE AREA(ACRES) = 32.10 AREA-AVERAGED Fm(INCH/HR) = 0.06

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.21

TOTAL AREA(ACRES) = 32.1 PEAK FLOW RATE(CFS) = 48.55

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.82 HALFSTREET FLOOD WIDTH(FEET) = 36.22

FLOW VELOCITY(FEET/SEC.) = 1.88 DEPTH*VELOCITY(FT*FT/SEC.) = 1.55

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 837.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 22.3 CFS,

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 130.50

LONGEST FLOWPATH FROM NODE 128.00 TO NODE 130.50 = 1692.00 FEET.

FLOW PROCESS FROM NODE 130.50 TO NODE 131.00 IS CODE = 31

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

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 74.00 DOWNSTREAM(FEET) = 73.50

FLOW LENGTH(FEET) = 188.00 MANNING'S N = 0.013

DEPTH OF FLOW IN 42.0 INCH PIPE IS 33.9 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 5.83

ESTIMATED PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) = 48.55

PIPE TRAVEL TIME(MIN.) = 0.54 Tc(MIN.) = 22.40

LONGEST FLOWPATH FROM NODE 128.00 TO NODE 131.00 = 1880.00 FEET.

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| END OF SYSTEM |
+-----+

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FLOW PROCESS FROM NODE 132.00 TO NODE 133.00 IS CODE = 21
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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

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

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=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 88.00 DOWNSTREAM(FEET) = 87.00
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Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
```

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SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.862
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* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751
```

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SUBAREA Tc AND LOSS RATE DATA(AMC II):
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DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	0.80	0.25	0.500	69	12.62
COMMERCIAL	C	0.90	0.25	0.100	69	9.86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.288
 SUBAREA RUNOFF(CFS) = 4.10
 TOTAL AREA(ACRES) = 1.70 PEAK FLOW RATE(CFS) = 4.10

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FLOW PROCESS FROM NODE 133.00 TO NODE 134.00 IS CODE = 62
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```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

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>>>>(STREET TABLE SECTION # 1 USED)<<<<<
```

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=====
UPSTREAM ELEVATION(FEET) = 87.00 DOWNSTREAM ELEVATION(FEET) = 84.00
STREET LENGTH(FEET) = 733.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00
```

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
```

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

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

```
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
```

```
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
```

```
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150
```

```
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
```

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.77
```

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STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
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STREET FLOW DEPTH(FEET) = 0.43
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HALFSTREET FLOOD WIDTH(FEET) = 15.66
```

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AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.88
```

```
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.81
```

```
STREET FLOW TRAVEL TIME(MIN.) = 6.51 Tc(MIN.) = 16.37
```

```
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.058
```

```
SUBAREA LOSS RATE DATA(AMC II):
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DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					

GC10
 "5-7 DWELLINGS/ACRE" C 3.30 0.25 0.500 69
 COMMERCIAL C 3.00 0.25 0.100 69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.310
 SUBAREA AREA(ACRES) = 6.30 SUBAREA RUNOFF(CFS) = 11.23
 EFFECTIVE AREA(ACRES) = 8.00 AREA-AVERAGED Fm(INCH/HR) = 0.08
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.30
 TOTAL AREA(ACRES) = 8.0 PEAK FLOW RATE(CFS) = 14.27

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 18.24
 FLOW VELOCITY(FEET/SEC.) = 2.05 DEPTH*VELOCITY(FT*FT/SEC.) = 0.99
 LONGEST FLOWPATH FROM NODE 132.00 TO NODE 134.00 = 1063.00 FEET.

FLOW PROCESS FROM NODE 134.00 TO NODE 135.00 IS CODE = 62

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<<

=====

UPSTREAM ELEVATION(FEET) = 84.00 DOWNSTREAM ELEVATION(FEET) = 83.50
 STREET LENGTH(FEET) = 385.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 27.84
 STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.68
 HALFSTREET FLOOD WIDTH(FEET) = 29.02
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.69
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.15
 STREET FLOW TRAVEL TIME(MIN.) = 3.80 Tc(MIN.) = 20.17
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.826

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	8.60	0.25	0.500	69
COMMERCIAL	C	8.60	0.25	0.100	69
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.300					
SUBAREA AREA(ACRES) = 17.20 SUBAREA RUNOFF(CFS) = 27.10					
EFFECTIVE AREA(ACRES) = 25.20 AREA-AVERAGED Fm(INCH/HR) = 0.08					
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.30					
TOTAL AREA(ACRES) = 25.2 PEAK FLOW RATE(CFS) = 39.69					

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.76 HALFSTREET FLOOD WIDTH(FEET) = 33.05
 FLOW VELOCITY(FEET/SEC.) = 1.85 DEPTH*VELOCITY(FT*FT/SEC.) = 1.41
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 385.0 FT WITH ELEVATION-DROP = 0.5 FT, IS 36.1 CFS,

GC10

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 135.00
LONGEST FLOWPATH FROM NODE 132.00 TO NODE 135.00 = 1448.00 FEET.

FLOW PROCESS FROM NODE 135.00 TO NODE 136.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 83.50 DOWNSTREAM(FEET) = 82.00
FLOW LENGTH(FEET) = 1072.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 45.0 INCH PIPE IS 34.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.41
ESTIMATED PIPE DIAMETER(INCH) = 45.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 39.69
PIPE TRAVEL TIME(MIN.) = 4.05 Tc(MIN.) = 24.22
LONGEST FLOWPATH FROM NODE 132.00 TO NODE 136.00 = 2520.00 FEET.

FLOW PROCESS FROM NODE 136.00 TO NODE 136.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN.) = 24.22
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.644
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	15.20	0.25	0.500	69
COMMERCIAL	C	13.20	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.314
SUBAREA AREA(ACRES) = 28.40 SUBAREA RUNOFF(CFS) = 40.01
EFFECTIVE AREA(ACRES) = 53.60 AREA-AVERAGED Fm(INCH/HR) = 0.08
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.31
TOTAL AREA(ACRES) = 53.6 PEAK FLOW RATE(CFS) = 75.58

FLOW PROCESS FROM NODE 136.00 TO NODE 137.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 82.00 DOWNSTREAM(FEET) = 76.00
FLOW LENGTH(FEET) = 1011.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 45.0 INCH PIPE IS 32.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 8.99
ESTIMATED PIPE DIAMETER(INCH) = 45.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 75.58
PIPE TRAVEL TIME(MIN.) = 1.87 Tc(MIN.) = 26.09
LONGEST FLOWPATH FROM NODE 132.00 TO NODE 137.00 = 3531.00 FEET.

FLOW PROCESS FROM NODE 137.00 TO NODE 137.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN.) = 26.09
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.575

GC10

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	16.20	0.25	0.500	69
COMMERCIAL	C	14.10	0.25	0.100	69
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.314					
SUBAREA AREA(ACRES) = 30.30		SUBAREA RUNOFF(CFS) = 40.81			
EFFECTIVE AREA(ACRES) = 83.90		AREA-AVERAGED Fm(INCH/HR) = 0.08			
AREA-AVERAGED Fp(INCH/HR) = 0.25		AREA-AVERAGED Ap = 0.31			
TOTAL AREA(ACRES) = 83.9		PEAK FLOW RATE(CFS) = 113.08			

FLOW PROCESS FROM NODE 137.00 TO NODE 141.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 76.00 DOWNSTREAM(FEET) = 74.00
 FLOW LENGTH(FEET) = 1012.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 63.0 INCH PIPE IS 46.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.54
 ESTIMATED PIPE DIAMETER(INCH) = 63.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 113.08
 PIPE TRAVEL TIME(MIN.) = 2.58 Tc(MIN.) = 28.67
 LONGEST FLOWPATH FROM NODE 132.00 TO NODE 141.00 = 4543.00 FEET.

FLOW PROCESS FROM NODE 141.00 TO NODE 141.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION(MIN.) = 28.67
 RAINFALL INTENSITY(INCH/HR) = 1.49
 AREA-AVERAGED Fm(INCH/HR) = 0.08
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.31
 EFFECTIVE STREAM AREA(ACRES) = 83.90
 TOTAL STREAM AREA(ACRES) = 83.90
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 113.08

FLOW PROCESS FROM NODE 138.00 TO NODE 139.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 76.00 DOWNSTREAM(FEET) = 75.50

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.329
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.541

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	B	2.10	0.30	0.100	56	11.33

GC10
 COMMERCIAL C 3.20 0.25 0.100 69 11.33
 URBAN POOR COVER
 "TURF" B 0.10 0.30 1.000 74 19.56
 SCHOOL B 3.20 0.30 0.600 56 15.35
 SCHOOL C 0.70 0.25 0.600 69 15.35
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.29
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.319
 SUBAREA RUNOFF(CFS) = 20.50
 TOTAL AREA(ACRES) = 9.30 PEAK FLOW RATE(CFS) = 20.50

FLOW PROCESS FROM NODE 139.00 TO NODE 140.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 75.50 DOWNSTREAM ELEVATION(FEET) = 75.00
 STREET LENGTH(FEET) = 560.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 33.61

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.77

HALFSTREET FLOOD WIDTH(FEET) = 33.29

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.54

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.18

STREET FLOW TRAVEL TIME(MIN.) = 6.06 Tc(MIN.) = 17.39

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.988

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	4.20	0.30	0.100	56
URBAN POOR COVER					
"TURF"	B	0.30	0.30	1.000	74
SCHOOL	B	5.00	0.30	0.600	56
SCHOOL	C	6.10	0.25	0.600	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.28

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.473

SUBAREA AREA(ACRES) = 15.60 SUBAREA RUNOFF(CFS) = 26.08

EFFECTIVE AREA(ACRES) = 24.90 AREA-AVERAGED Fm(INCH/HR) = 0.12

AREA-AVERAGED Fp(INCH/HR) = 0.28 AREA-AVERAGED Ap = 0.42

TOTAL AREA(ACRES) = 24.9 PEAK FLOW RATE(CFS) = 41.95

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.82 HALFSTREET FLOOD WIDTH(FEET) = 36.16

FLOW VELOCITY(FEET/SEC.) = 1.63 DEPTH*VELOCITY(FT*FT/SEC.) = 1.34

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 560.0 FT WITH ELEVATION-DROP = 0.5 FT, IS 27.9 CFS,

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 140.00

LONGEST FLOWPATH FROM NODE 138.00 TO NODE 140.00 = 890.00 FEET.

GC10

 FLOW PROCESS FROM NODE 140.00 TO NODE 141.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 75.00 DOWNSTREAM(FEET) = 74.00
 FLOW LENGTH(FEET) = 391.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 42.0 INCH PIPE IS 30.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 5.65
 ESTIMATED PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 41.95
 PIPE TRAVEL TIME(MIN.) = 1.15 Tc(MIN.) = 18.54
 LONGEST FLOWPATH FROM NODE 138.00 TO NODE 141.00 = 1281.00 FEET.

 FLOW PROCESS FROM NODE 141.00 TO NODE 141.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN.) = 18.54
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.916
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL "5-7 DWELLINGS/ACRE"	B	1.30	0.30	0.500	56
RESIDENTIAL "5-7 DWELLINGS/ACRE"	C	2.00	0.25	0.500	69
COMMERCIAL	B	3.60	0.30	0.100	56
COMMERCIAL	C	4.80	0.25	0.100	69
URBAN POOR COVER "TURF"	B	0.20	0.30	1.000	74

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.226
 SUBAREA AREA(ACRES) = 11.90 SUBAREA RUNOFF(CFS) = 19.86
 EFFECTIVE AREA(ACRES) = 36.80 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.28 AREA-AVERAGED Ap = 0.35
 TOTAL AREA(ACRES) = 36.8 PEAK FLOW RATE(CFS) = 60.20

 FLOW PROCESS FROM NODE 141.00 TO NODE 141.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 18.54
 RAINFALL INTENSITY(INCH/HR) = 1.92
 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.28
 AREA-AVERAGED Ap = 0.35
 EFFECTIVE STREAM AREA(ACRES) = 36.80
 TOTAL STREAM AREA(ACRES) = 36.80
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 60.20

** CONFLUENCE DATA **

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
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GC10							
NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE	
1	113.08	28.67	1.492	0.25(0.08)	0.31	83.9	132.00
2	60.20	18.54	1.916	0.28(0.10)	0.35	36.8	138.00

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	155.20	18.54	1.916	0.26(0.09)	0.33	91.1	138.00
2	159.25	28.67	1.492	0.26(0.08)	0.32	120.7	132.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 159.25 Tc(MIN.) = 28.67
EFFECTIVE AREA(ACRES) = 120.70 AREA-AVERAGED Fm(INCH/HR) = 0.08
AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.32
TOTAL AREA(ACRES) = 120.7
LONGEST FLOWPATH FROM NODE 132.00 TO NODE 141.00 = 4543.00 FEET.

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+-----+
| END OF SYSTEM |
+-----+

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FLOW PROCESS FROM NODE 142.00 TO NODE 143.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 78.00 DOWNSTREAM(FEET) = 77.50

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.329
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.541
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.)
APARTMENTS	B	0.30	0.30	0.200	56	12.07
COMMERCIAL	B	0.40	0.30	0.100	56	11.33

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.143
SUBAREA RUNOFF(CFS) = 1.57
TOTAL AREA(ACRES) = 0.70 PEAK FLOW RATE(CFS) = 1.57

FLOW PROCESS FROM NODE 143.00 TO NODE 144.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 77.50 DOWNSTREAM ELEVATION(FEET) = 77.00
STREET LENGTH(FEET) = 307.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020

GC10

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2.93

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.35

HALFSTREET FLOOD WIDTH(FEET) = 11.52

AVERAGE FLOW VELOCITY(FEET/SEC.) = 0.99

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.34

STREET FLOW TRAVEL TIME(MIN.) = 5.16 Tc(MIN.) = 16.49

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.049

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
APARTMENTS	B	1.20	0.30	0.200	56
COMMERCIAL	B	0.30	0.30	0.100	56

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.180

SUBAREA AREA(ACRES) = 1.50 SUBAREA RUNOFF(CFS) = 2.69

EFFECTIVE AREA(ACRES) = 2.20 AREA-AVERAGED Fm(INCH/HR) = 0.05

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.17

TOTAL AREA(ACRES) = 2.2 PEAK FLOW RATE(CFS) = 3.96

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.38 HALFSTREET FLOOD WIDTH(FEET) = 13.09

FLOW VELOCITY(FEET/SEC.) = 1.06 DEPTH*VELOCITY(FT*FT/SEC.) = 0.40

LONGEST FLOWPATH FROM NODE 142.00 TO NODE 144.00 = 637.00 FEET.

FLOW PROCESS FROM NODE 144.00 TO NODE 145.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 77.00 DOWNSTREAM ELEVATION(FEET) = 76.00

STREET LENGTH(FEET) = 632.00 CURB HEIGHT(INCHES) = 6.0

STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.76

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.44

HALFSTREET FLOOD WIDTH(FEET) = 16.37

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.20

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.53

STREET FLOW TRAVEL TIME(MIN.) = 8.80 Tc(MIN.) = 25.29

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.603

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	GC10 Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
APARTMENTS	B	3.30	0.30	0.200	56
COMMERCIAL	B	0.70	0.30	0.100	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.183
 SUBAREA AREA(ACRES) = 4.00 SUBAREA RUNOFF(CFS) = 5.58
 EFFECTIVE AREA(ACRES) = 6.20 AREA-AVERAGED Fm(INCH/HR) = 0.05
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.18
 TOTAL AREA(ACRES) = 6.2 PEAK FLOW RATE(CFS) = 8.65

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 18.01
 FLOW VELOCITY(FEET/SEC.) = 1.28 DEPTH*VELOCITY(FT*FT/SEC.) = 0.61
 LONGEST FLOWPATH FROM NODE 142.00 TO NODE 145.00 = 1269.00 FEET.

 FLOW PROCESS FROM NODE 145.00 TO NODE 146.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<<

=====
 UPSTREAM ELEVATION(FEET) = 76.00 DOWNSTREAM ELEVATION(FEET) = 72.00
 STREET LENGTH(FEET) = 1273.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 15.90

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.52

HALFSTREET FLOOD WIDTH(FEET) = 20.84

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.91

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.99

STREET FLOW TRAVEL TIME(MIN.) = 11.12 Tc(MIN.) = 36.41

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.301

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	2.50	0.30	0.500	56
COMMERCIAL	B	2.70	0.30	0.100	56
SCHOOL	B	8.60	0.30	0.600	56

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.484

SUBAREA AREA(ACRES) = 13.80 SUBAREA RUNOFF(CFS) = 14.36

EFFECTIVE AREA(ACRES) = 20.00 AREA-AVERAGED Fm(INCH/HR) = 0.12

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.39

TOTAL AREA(ACRES) = 20.0 PEAK FLOW RATE(CFS) = 21.32

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.56 HALFSTREET FLOOD WIDTH(FEET) = 22.80

GC10

FLOW VELOCITY(FEET/SEC.) = 2.12 DEPTH*VELOCITY(FT*FT/SEC.) = 1.18

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 1273.0 FT WITH ELEVATION-DROP = 4.0 FT, IS 23.4 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 146.00
LONGEST FLOWPATH FROM NODE 142.00 TO NODE 146.00 = 2542.00 FEET.

FLOW PROCESS FROM NODE 146.00 TO NODE 146.50 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 2 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 72.00 DOWNSTREAM ELEVATION(FEET) = 71.00

STREET LENGTH(FEET) = 594.00 CURB HEIGHT(INCHES) = 8.0

STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 30.68

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.74

HALFSTREET FLOOD WIDTH(FEET) = 32.58

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.76

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.30

STREET FLOW TRAVEL TIME(MIN.) = 5.63 Tc(MIN.) = 42.05

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.198

SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Rows include Residential, Commercial, and Urban Poor Cover.

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.29

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.395

SUBAREA AREA(ACRES) = 19.20 SUBAREA RUNOFF(CFS) = 18.71

EFFECTIVE AREA(ACRES) = 39.20 AREA-AVERAGED Fm(INCH/HR) = 0.12

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.39

TOTAL AREA(ACRES) = 39.2 PEAK FLOW RATE(CFS) = 38.18

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.79 HALFSTREET FLOOD WIDTH(FEET) = 37.50

FLOW VELOCITY(FEET/SEC.) = 1.83 DEPTH*VELOCITY(FT*FT/SEC.) = 1.44

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 594.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 36.8 CFS,

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 146.50

LONGEST FLOWPATH FROM NODE 142.00 TO NODE 146.50 = 3136.00 FEET.

GC10
FLOW PROCESS FROM NODE 146.50 TO NODE 147.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) =	71.00	DOWNSTREAM(FEET) =	70.00
FLOW LENGTH(FEET) =	74.00	MANNING'S N =	0.013
DEPTH OF FLOW IN 30.0 INCH PIPE IS	21.1 INCHES		
PIPE-FLOW VELOCITY(FEET/SEC.) =	10.33		
ESTIMATED PIPE DIAMETER(INCH) =	30.00	NUMBER OF PIPES =	1
PIPE-FLOW(CFS) =	38.18		
PIPE TRAVEL TIME(MIN.) =	0.12	Tc(MIN.) =	42.17
LONGEST FLOWPATH FROM NODE 142.00 TO NODE 147.00 =	3210.00 FEET.		

+-----+
| END OF SYSTEM |
+-----+

FLOW PROCESS FROM NODE 148.00 TO NODE 149.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) =	330.00		
ELEVATION DATA: UPSTREAM(FEET) =	74.00	DOWNSTREAM(FEET) =	72.00

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.586
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	B	1.30	0.30	0.500	56	10.99
COMMERCIAL	B	0.60	0.30	0.100	56	8.59

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.374

SUBAREA RUNOFF(CFS) = 4.90

TOTAL AREA(ACRES) = 1.90 PEAK FLOW RATE(CFS) = 4.90

FLOW PROCESS FROM NODE 149.00 TO NODE 150.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) =	72.00	DOWNSTREAM ELEVATION(FEET) =	70.00
STREET LENGTH(FEET) =	341.00	CURB HEIGHT(INCHES) =	6.0
STREET HALFWIDTH(FEET) =	20.00		

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

GC10

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.30

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.40

HALFSTREET FLOOD WIDTH(FEET) = 14.26

AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.13

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.86

STREET FLOW TRAVEL TIME(MIN.) = 2.67 Tc(MIN.) = 11.25

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.551

SUBAREA LOSS RATE DATA(AMC II):

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

"5-7 DWELLINGS/ACRE" B 2.80 0.30 0.500 56

COMMERCIAL B 1.20 0.30 0.100 56

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.380

SUBAREA AREA(ACRES) = 4.00 SUBAREA RUNOFF(CFS) = 8.77

EFFECTIVE AREA(ACRES) = 5.90 AREA-AVERAGED Fm(INCH/HR) = 0.11

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.38

TOTAL AREA(ACRES) = 5.9 PEAK FLOW RATE(CFS) = 12.94

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.44 HALFSTREET FLOOD WIDTH(FEET) = 16.29

FLOW VELOCITY(FEET/SEC.) = 2.31 DEPTH*VELOCITY(FT*FT/SEC.) = 1.02

LONGEST FLOWPATH FROM NODE 148.00 TO NODE 150.00 = 671.00 FEET.

FLOW PROCESS FROM NODE 150.00 TO NODE 151.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 70.00 DOWNSTREAM ELEVATION(FEET) = 69.50

STREET LENGTH(FEET) = 383.00 CURB HEIGHT(INCHES) = 6.0

STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 17.72

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.60

HALFSTREET FLOOD WIDTH(FEET) = 24.81

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.48

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.88

STREET FLOW TRAVEL TIME(MIN.) = 4.31 Tc(MIN.) = 15.56

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.118

SUBAREA LOSS RATE DATA(AMC II):

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

GC10
 "5-7 DWELLINGS/ACRE" B 4.00 0.30 0.500 56
 COMMERCIAL B 1.30 0.30 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.402
 SUBAREA AREA(ACRES) = 5.30 SUBAREA RUNOFF(CFS) = 9.53
 EFFECTIVE AREA(ACRES) = 11.20 AREA-AVERAGED Fm(INCH/HR) = 0.12
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.39
 TOTAL AREA(ACRES) = 11.2 PEAK FLOW RATE(CFS) = 20.18

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.62 HALFSTREET FLOOD WIDTH(FEET) = 25.91
 FLOW VELOCITY(FEET/SEC.) = 1.54 DEPTH*VELOCITY(FT*FT/SEC.) = 0.95
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 383.0 FT WITH ELEVATION-DROP = 0.5 FT, IS 10.9 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 151.00
 LONGEST FLOWPATH FROM NODE 148.00 TO NODE 151.00 = 1054.00 FEET.

FLOW PROCESS FROM NODE 151.00 TO NODE 151.50 IS CODE = 62

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

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UPSTREAM ELEVATION(FEET) = 69.50 DOWNSTREAM ELEVATION(FEET) = 69.00
 STREET LENGTH(FEET) = 502.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25.68

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.69

HALFSTREET FLOOD WIDTH(FEET) = 29.57

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.50

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.04

STREET FLOW TRAVEL TIME(MIN.) = 5.58 Tc(MIN.) = 21.14

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.777

SUBAREA LOSS RATE DATA(AMC II):

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

"5-7 DWELLINGS/ACRE"	B	5.30	0.30	0.500	56
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COMMERCIAL	B	1.80	0.30	0.100	56
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URBAN POOR COVER

"TURF"	B	0.30	0.30	1.000	74
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SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.423

SUBAREA AREA(ACRES) = 7.40 SUBAREA RUNOFF(CFS) = 10.99

EFFECTIVE AREA(ACRES) = 18.60 AREA-AVERAGED Fm(INCH/HR) = 0.12

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.40

TOTAL AREA(ACRES) = 18.6 PEAK FLOW RATE(CFS) = 27.72

GC10

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.71 HALFSTREET FLOOD WIDTH(FEET) = 30.43
 FLOW VELOCITY(FEET/SEC.) = 1.53 DEPTH*VELOCITY(FT*FT/SEC.) = 1.08
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 502.0 FT WITH ELEVATION-DROP = 0.5 FT, IS 13.8 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 151.50
 LONGEST FLOWPATH FROM NODE 148.00 TO NODE 151.50 = 1556.00 FEET.

 FLOW PROCESS FROM NODE 151.50 TO NODE 152.00 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) = 69.00 DOWNSTREAM(FEET) = 68.50
 FLOW LENGTH(FEET) = 168.16 MANNING'S N = 0.013
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 24.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 5.43
 ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 27.72
 PIPE TRAVEL TIME(MIN.) = 0.52 Tc(MIN.) = 21.66
 LONGEST FLOWPATH FROM NODE 148.00 TO NODE 152.00 = 1724.16 FEET.

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 | END OF SYSTEM |
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 FLOW PROCESS FROM NODE 153.00 TO NODE 154.00 IS CODE = 21

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

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INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 70.00 DOWNSTREAM(FEET) = 69.50

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.329
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.541
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL "5-7 DWELLINGS/ACRE"	B	1.50	0.30	0.500	56	14.50
RESIDENTIAL "5-7 DWELLINGS/ACRE"	C	0.10	0.25	0.500	69	14.50
COMMERCIAL	B	0.60	0.30	0.100	56	11.33

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.391
 SUBAREA RUNOFF(CFS) = 4.80
 TOTAL AREA(ACRES) = 2.20 PEAK FLOW RATE(CFS) = 4.80

 FLOW PROCESS FROM NODE 154.00 TO NODE 155.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

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GC10

UPSTREAM ELEVATION(FEET) = 69.50 DOWNSTREAM ELEVATION(FEET) = 69.00
STREET LENGTH(FEET) = 403.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.94
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.52
HALFSTREET FLOOD WIDTH(FEET) = 20.73
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.20
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.62
STREET FLOW TRAVEL TIME(MIN.) = 5.59 Tc(MIN.) = 16.92
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.019

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL "5-7 DWELLINGS/ACRE"	B	3.80	0.30	0.500	56
RESIDENTIAL "5-7 DWELLINGS/ACRE"	C	0.10	0.25	0.500	69
COMMERCIAL	B	1.50	0.30	0.100	56
URBAN POOR COVER "TURF"	B	0.60	0.30	1.000	74

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.450
SUBAREA AREA(ACRES) = 6.00 SUBAREA RUNOFF(CFS) = 10.17
EFFECTIVE AREA(ACRES) = 8.20 AREA-AVERAGED Fm(INCH/HR) = 0.13
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.43
TOTAL AREA(ACRES) = 8.2 PEAK FLOW RATE(CFS) = 13.94

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.56 HALFSTREET FLOOD WIDTH(FEET) = 23.10
FLOW VELOCITY(FEET/SEC.) = 1.35 DEPTH*VELOCITY(FT*FT/SEC.) = 0.76
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 403.0 FT WITH ELEVATION-DROP = 0.5 FT, IS 12.1 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 155.00
LONGEST FLOWPATH FROM NODE 153.00 TO NODE 155.00 = 733.00 FEET.

FLOW PROCESS FROM NODE 155.00 TO NODE 156.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 69.00 DOWNSTREAM(FEET) = 68.50
FLOW LENGTH(FEET) = 123.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 27.0 INCH PIPE IS 17.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.16
ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 13.94
PIPE TRAVEL TIME(MIN.) = 0.40 Tc(MIN.) = 17.32
LONGEST FLOWPATH FROM NODE 153.00 TO NODE 156.00 = 856.00 FEET.

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| END OF SYSTEM                                     |
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FLOW PROCESS FROM NODE 157.00 TO NODE 158.00 IS CODE = 21

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 74.00 DOWNSTREAM(FEET) = 72.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.586
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	3.30	0.25	0.500	69	10.99
COMMERCIAL	C	0.90	0.25	0.100	69	8.59

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.414
 SUBAREA RUNOFF(CFS) = 10.87
 TOTAL AREA(ACRES) = 4.20 PEAK FLOW RATE(CFS) = 10.87

FLOW PROCESS FROM NODE 158.00 TO NODE 159.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 72.00 DOWNSTREAM ELEVATION(FEET) = 70.00
 STREET LENGTH(FEET) = 307.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 15.33
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.46
 HALFSTREET FLOOD WIDTH(FEET) = 17.07
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.50
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.15
 STREET FLOW TRAVEL TIME(MIN.) = 2.04 Tc(MIN.) = 10.63
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.635

SUBAREA LOSS RATE DATA(AMC II):

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

GC10

RESIDENTIAL

"5-7 DWELLINGS/ACRE" C 2.60 0.25 0.500 69
 COMMERCIAL C 1.30 0.25 0.100 69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.367
 SUBAREA AREA(ACRES) = 3.90 SUBAREA RUNOFF(CFS) = 8.93
 EFFECTIVE AREA(ACRES) = 8.10 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.39
 TOTAL AREA(ACRES) = 8.1 PEAK FLOW RATE(CFS) = 18.50

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 18.40
 FLOW VELOCITY(FEET/SEC.) = 2.62 DEPTH*VELOCITY(FT*FT/SEC.) = 1.27
 LONGEST FLOWPATH FROM NODE 157.00 TO NODE 159.00 = 637.00 FEET.

FLOW PROCESS FROM NODE 159.00 TO NODE 159.50 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<<

UPSTREAM ELEVATION(FEET) = 70.00 DOWNSTREAM ELEVATION(FEET) = 69.50
 STREET LENGTH(FEET) = 624.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25.34

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.71
 HALFSTREET FLOOD WIDTH(FEET) = 30.61
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.38
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.98
 STREET FLOW TRAVEL TIME(MIN.) = 7.55 Tc(MIN.) = 18.17
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.938

SUBAREA LOSS RATE DATA(AMC II):

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

"5-7 DWELLINGS/ACRE"	C	5.70	0.25	0.500	69
COMMERCIAL	C	2.50	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.378
 SUBAREA AREA(ACRES) = 8.20 SUBAREA RUNOFF(CFS) = 13.60
 EFFECTIVE AREA(ACRES) = 16.30 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.38
 TOTAL AREA(ACRES) = 16.3 PEAK FLOW RATE(CFS) = 27.02

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.73 HALFSTREET FLOOD WIDTH(FEET) = 31.34
 FLOW VELOCITY(FEET/SEC.) = 1.40 DEPTH*VELOCITY(FT*FT/SEC.) = 1.02
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

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AND L = 624.0 FT WITH ELEVATION-DROP = 0.5 FT, IS 14.4 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 159.50
LONGEST FLOWPATH FROM NODE 157.00 TO NODE 159.50 = 1261.00 FEET.

FLOW PROCESS FROM NODE 159.50 TO NODE 160.00 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) = 69.50 DOWNSTREAM(FEET) = 69.00
FLOW LENGTH(FEET) = 110.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 33.0 INCH PIPE IS 22.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.33
ESTIMATED PIPE DIAMETER(INCH) = 33.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 27.02
PIPE TRAVEL TIME(MIN.) = 0.29 Tc(MIN.) = 18.46
LONGEST FLOWPATH FROM NODE 157.00 TO NODE 160.00 = 1371.00 FEET.

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| END OF SYSTEM |
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FLOW PROCESS FROM NODE 161.00 TO NODE 162.00 IS CODE = 21

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

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INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 86.00 DOWNSTREAM(FEET) = 85.00

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

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.862

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	1.50	0.25	0.500	69	12.62
COMMERCIAL	C	0.50	0.25	0.100	69	9.86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.400

SUBAREA RUNOFF(CFS) = 4.77

TOTAL AREA(ACRES) = 2.00 PEAK FLOW RATE(CFS) = 4.77

FLOW PROCESS FROM NODE 162.00 TO NODE 163.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

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UPSTREAM ELEVATION(FEET) = 85.00 DOWNSTREAM ELEVATION(FEET) = 84.00
STREET LENGTH(FEET) = 437.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

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OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.57

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.43

HALFSTREET FLOOD WIDTH(FEET) = 15.90

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.41

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.61

STREET FLOW TRAVEL TIME(MIN.) = 5.15 Tc(MIN.) = 15.01

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.162

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	2.10	0.25	0.500	69
COMMERCIAL	C	0.80	0.25	0.100	69
URBAN POOR COVER					
"TURF"	C	0.10	0.25	1.000	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.410

SUBAREA AREA(ACRES) = 3.00 SUBAREA RUNOFF(CFS) = 5.56

EFFECTIVE AREA(ACRES) = 5.00 AREA-AVERAGED Fm(INCH/HR) = 0.10

AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.41

TOTAL AREA(ACRES) = 5.0 PEAK FLOW RATE(CFS) = 9.27

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.46 HALFSTREET FLOOD WIDTH(FEET) = 17.23

FLOW VELOCITY(FEET/SEC.) = 1.49 DEPTH*VELOCITY(FT*FT/SEC.) = 0.69

LONGEST FLOWPATH FROM NODE 161.00 TO NODE 163.00 = 767.00 FEET.

FLOW PROCESS FROM NODE 163.00 TO NODE 164.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 84.00 DOWNSTREAM ELEVATION(FEET) = 82.00

STREET LENGTH(FEET) = 283.00 CURB HEIGHT(INCHES) = 6.0

STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 13.59

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.44

HALFSTREET FLOOD WIDTH(FEET) = 16.05

AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.49

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.09

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STREET FLOW TRAVEL TIME(MIN.) = 1.89 Tc(MIN.) = 16.90
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.020

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	3.90	0.25	0.500	69
COMMERCIAL	C	1.10	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.412
 SUBAREA AREA(ACRES) = 5.00 SUBAREA RUNOFF(CFS) = 8.63
 EFFECTIVE AREA(ACRES) = 10.00 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.41
 TOTAL AREA(ACRES) = 10.0 PEAK FLOW RATE(CFS) = 17.26

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.47 HALFSTREET FLOOD WIDTH(FEET) = 17.62
 FLOW VELOCITY(FEET/SEC.) = 2.65 DEPTH*VELOCITY(FT*FT/SEC.) = 1.24
 LONGEST FLOWPATH FROM NODE 161.00 TO NODE 164.00 = 1050.00 FEET.

FLOW PROCESS FROM NODE 164.00 TO NODE 165.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<<

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UPSTREAM ELEVATION(FEET) = 82.00 DOWNSTREAM ELEVATION(FEET) = 80.00
 STREET LENGTH(FEET) = 584.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25.05
 STREET FLOWING FULL
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.57
 HALFSTREET FLOOD WIDTH(FEET) = 23.71
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.30
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.32
 STREET FLOW TRAVEL TIME(MIN.) = 4.23 Tc(MIN.) = 21.14
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.777

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	7.70	0.25	0.500	69
COMMERCIAL	C	2.60	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.399
 SUBAREA AREA(ACRES) = 10.30 SUBAREA RUNOFF(CFS) = 15.55
 EFFECTIVE AREA(ACRES) = 20.30 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.40
 TOTAL AREA(ACRES) = 20.3 PEAK FLOW RATE(CFS) = 30.63

GC10

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.61 HALFSTREET FLOOD WIDTH(FEET) = 25.36
 FLOW VELOCITY(FEET/SEC.) = 2.45 DEPTH*VELOCITY(FT*FT/SEC.) = 1.49
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 584.0 FT WITH ELEVATION-DROP = 2.0 FT, IS 21.8 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 165.00
 LONGEST FLOWPATH FROM NODE 161.00 TO NODE 165.00 = 1634.00 FEET.

 FLOW PROCESS FROM NODE 165.00 TO NODE 166.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<<

=====

UPSTREAM ELEVATION(FEET) = 80.00 DOWNSTREAM ELEVATION(FEET) = 78.00
 STREET LENGTH(FEET) = 939.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 41.10

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.71
 HALFSTREET FLOOD WIDTH(FEET) = 30.55
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.24
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.60
 STREET FLOW TRAVEL TIME(MIN.) = 6.97 Tc(MIN.) = 28.11
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.509

SUBAREA LOSS RATE DATA(AMC II):

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

"5-7 DWELLINGS/ACRE"	C	12.60	0.25	0.500	69
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COMMERCIAL	C	3.90	0.25	0.100	69
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SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.405

SUBAREA AREA(ACRES) = 16.50 SUBAREA RUNOFF(CFS) = 20.91

EFFECTIVE AREA(ACRES) = 36.80 AREA-AVERAGED Fm(INCH/HR) = 0.10

AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.40

TOTAL AREA(ACRES) = 36.8 PEAK FLOW RATE(CFS) = 46.64

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.74 HALFSTREET FLOOD WIDTH(FEET) = 32.01
 FLOW VELOCITY(FEET/SEC.) = 2.32 DEPTH*VELOCITY(FT*FT/SEC.) = 1.71
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 939.0 FT WITH ELEVATION-DROP = 2.0 FT, IS 29.4 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 166.00
 LONGEST FLOWPATH FROM NODE 161.00 TO NODE 166.00 = 2573.00 FEET.

 FLOW PROCESS FROM NODE 166.00 TO NODE 167.00 IS CODE = 62

GC10

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 78.00 DOWNSTREAM ELEVATION(FEET) = 73.00
 STREET LENGTH(FEET) = 761.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 62.14
 STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.68
 HALFSTREET FLOOD WIDTH(FEET) = 28.96
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.78
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.57
 STREET FLOW TRAVEL TIME(MIN.) = 3.35 Tc(MIN.) = 31.46
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.415

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	18.00	0.25	0.500	69
COMMERCIAL	C	7.90	0.25	0.100	69
URBAN POOR COVER					
"TURF"	C	0.20	0.25	1.000	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.383
 SUBAREA AREA(ACRES) = 26.10 SUBAREA RUNOFF(CFS) = 30.99
 EFFECTIVE AREA(ACRES) = 62.90 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.40
 TOTAL AREA(ACRES) = 62.9 PEAK FLOW RATE(CFS) = 74.51

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.72 HALFSTREET FLOOD WIDTH(FEET) = 30.91
 FLOW VELOCITY(FEET/SEC.) = 3.97 DEPTH*VELOCITY(FT*FT/SEC.) = 2.85
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 761.0 FT WITH ELEVATION-DROP = 5.0 FT, IS 56.1 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 167.00
 LONGEST FLOWPATH FROM NODE 161.00 TO NODE 167.00 = 3334.00 FEET.

 FLOW PROCESS FROM NODE 167.00 TO NODE 168.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 73.00 DOWNSTREAM ELEVATION(FEET) = 72.00
 STREET LENGTH(FEET) = 291.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

GC10

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

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 84.87
STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.83
HALFSTREET FLOOD WIDTH(FEET) = 36.59
AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.21
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.67
STREET FLOW TRAVEL TIME(MIN.) = 1.51 Tc(MIN.) = 32.97
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.378

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	12.60	0.25	0.500	69
COMMERCIAL	C	5.10	0.25	0.100	69
URBAN POOR COVER					
"TURF"	C	0.30	0.25	1.000	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.395
SUBAREA AREA(ACRES) = 18.00 SUBAREA RUNOFF(CFS) = 20.72
EFFECTIVE AREA(ACRES) = 80.90 AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.40
TOTAL AREA(ACRES) = 80.9 PEAK FLOW RATE(CFS) = 93.10

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.86 HALFSTREET FLOOD WIDTH(FEET) = 37.93
FLOW VELOCITY(FEET/SEC.) = 3.28 DEPTH*VELOCITY(FT*FT/SEC.) = 2.81
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 291.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 44.9 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 168.00
LONGEST FLOWPATH FROM NODE 161.00 TO NODE 168.00 = 3625.00 FEET.

FLOW PROCESS FROM NODE 168.00 TO NODE 169.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 72.00 DOWNSTREAM(FEET) = 70.00
FLOW LENGTH(FEET) = 621.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 54.0 INCH PIPE IS 39.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 7.51
ESTIMATED PIPE DIAMETER(INCH) = 54.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 93.10
PIPE TRAVEL TIME(MIN.) = 1.38 Tc(MIN.) = 34.35
LONGEST FLOWPATH FROM NODE 161.00 TO NODE 169.00 = 4246.00 FEET.

+-----+
| END OF SYSTEM |
+-----+

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FLOW PROCESS FROM NODE 170.00 TO NODE 171.00 IS CODE = 21

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

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INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 68.00 DOWNSTREAM(FEET) = 67.00

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

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.862

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	2.50	0.25	0.500	69	12.62
COMMERCIAL	C	0.70	0.25	0.100	69	9.86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.413

SUBAREA RUNOFF(CFS) = 7.62

TOTAL AREA(ACRES) = 3.20 PEAK FLOW RATE(CFS) = 7.62

FLOW PROCESS FROM NODE 171.00 TO NODE 172.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 67.00 DOWNSTREAM ELEVATION(FEET) = 66.00
STREET LENGTH(FEET) = 398.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.30

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.48

HALFSTREET FLOOD WIDTH(FEET) = 18.32

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.61

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.78

STREET FLOW TRAVEL TIME(MIN.) = 4.11 Tc(MIN.) = 13.98

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.253

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	0.60	0.30	0.500	56
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	2.40	0.25	0.500	69
COMMERCIAL	B	0.10	0.30	0.100	56
COMMERCIAL	C	0.70	0.25	0.100	69

GC10

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.416
SUBAREA AREA(ACRES) = 3.80 SUBAREA RUNOFF(CFS) = 7.33
EFFECTIVE AREA(ACRES) = 7.00 AREA-AVERAGED Fm(INCH/HR) = 0.11
AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.41
TOTAL AREA(ACRES) = 7.0 PEAK FLOW RATE(CFS) = 13.53

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.51 HALFSTREET FLOOD WIDTH(FEET) = 20.11
FLOW VELOCITY(FEET/SEC.) = 1.69 DEPTH*VELOCITY(FT*FT/SEC.) = 0.86
LONGEST FLOWPATH FROM NODE 170.00 TO NODE 172.00 = 728.00 FEET.

FLOW PROCESS FROM NODE 172.00 TO NODE 173.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 66.00 DOWNSTREAM ELEVATION(FEET) = 65.50
STREET LENGTH(FEET) = 435.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 17.75

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.61
HALFSTREET FLOOD WIDTH(FEET) = 25.36
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.42
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.86
STREET FLOW TRAVEL TIME(MIN.) = 5.11 Tc(MIN.) = 19.08
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.884

SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Rows include Residential (5-7 Dwellings/Acre) and Commercial.

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.394
SUBAREA AREA(ACRES) = 5.30 SUBAREA RUNOFF(CFS) = 8.43
EFFECTIVE AREA(ACRES) = 12.30 AREA-AVERAGED Fm(INCH/HR) = 0.11
AREA-AVERAGED Fp(INCH/HR) = 0.27 AREA-AVERAGED Ap = 0.41
TOTAL AREA(ACRES) = 12.3 PEAK FLOW RATE(CFS) = 19.63

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.62 HALFSTREET FLOOD WIDTH(FEET) = 26.21
FLOW VELOCITY(FEET/SEC.) = 1.47 DEPTH*VELOCITY(FT*FT/SEC.) = 0.92

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 435.0 FT WITH ELEVATION-DROP = 0.5 FT, IS 10.5 CFS,

GC10

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 173.00
LONGEST FLOWPATH FROM NODE 170.00 TO NODE 173.00 = 1163.00 FEET.

FLOW PROCESS FROM NODE 173.00 TO NODE 174.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 65.50 DOWNSTREAM(FEET) = 65.00
FLOW LENGTH(FEET) = 149.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 30.0 INCH PIPE IS 21.7 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.17
ESTIMATED PIPE DIAMETER(INCH) = 30.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 19.63
PIPE TRAVEL TIME(MIN.) = 0.48 Tc(MIN.) = 19.56
LONGEST FLOWPATH FROM NODE 170.00 TO NODE 174.00 = 1312.00 FEET.

+-----+
| END OF SYSTEM |
+-----+

FLOW PROCESS FROM NODE 175.00 TO NODE 176.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 74.00 DOWNSTREAM(FEET) = 72.00

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.586

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	B	3.40	0.30	0.500	56	10.99
COMMERCIAL	B	0.40	0.30	0.100	56	8.59

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.458

SUBAREA RUNOFF(CFS) = 9.72

TOTAL AREA(ACRES) = 3.80 PEAK FLOW RATE(CFS) = 9.72

FLOW PROCESS FROM NODE 176.00 TO NODE 177.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 72.00 DOWNSTREAM ELEVATION(FEET) = 70.00
STREET LENGTH(FEET) = 522.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

GC10

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.82

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.53

HALFSTREET FLOOD WIDTH(FEET) = 21.27

AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.16

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.14

STREET FLOW TRAVEL TIME(MIN.) = 4.02 Tc(MIN.) = 12.61

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.390

SUBAREA LOSS RATE DATA(AMC II):

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

RESIDENTIAL

"5-7 DWELLINGS/ACRE" B 7.90 0.30 0.500 56

COMMERCIAL B 1.00 0.30 0.100 56

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.455

SUBAREA AREA(ACRES) = 8.90 SUBAREA RUNOFF(CFS) = 18.05

EFFECTIVE AREA(ACRES) = 12.70 AREA-AVERAGED Fm(INCH/HR) = 0.14

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.46

TOTAL AREA(ACRES) = 12.7 PEAK FLOW RATE(CFS) = 25.75

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.57 HALFSTREET FLOOD WIDTH(FEET) = 23.47

FLOW VELOCITY(FEET/SEC.) = 2.42 DEPTH*VELOCITY(FT*FT/SEC.) = 1.38

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 522.0 FT WITH ELEVATION-DROP = 2.0 FT, IS 19.3 CFS,

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 177.00

LONGEST FLOWPATH FROM NODE 175.00 TO NODE 177.00 = 852.00 FEET.

FLOW PROCESS FROM NODE 177.00 TO NODE 178.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 70.00 DOWNSTREAM ELEVATION(FEET) = 68.00

STREET LENGTH(FEET) = 539.00 CURB HEIGHT(INCHES) = 6.0

STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 36.00

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.63

HALFSTREET FLOOD WIDTH(FEET) = 26.40

GC10

AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.65
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.66
STREET FLOW TRAVEL TIME(MIN.) = 3.39 Tc(MIN.) = 15.99
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.085

SUBAREA LOSS RATE DATA(AMC II):

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

"5-7 DWELLINGS/ACRE" B 10.90 0.30 0.500 56

COMMERCIAL B 0.80 0.30 0.100 56

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.473

SUBAREA AREA(ACRES) = 11.70 SUBAREA RUNOFF(CFS) = 20.46

EFFECTIVE AREA(ACRES) = 24.40 AREA-AVERAGED Fm(INCH/HR) = 0.14

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.46

TOTAL AREA(ACRES) = 24.4 PEAK FLOW RATE(CFS) = 42.73

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 28.05

FLOW VELOCITY(FEET/SEC.) = 2.78 DEPTH*VELOCITY(FT*FT/SEC.) = 1.84

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 539.0 FT WITH ELEVATION-DROP = 2.0 FT, IS 25.0 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 178.00
LONGEST FLOWPATH FROM NODE 175.00 TO NODE 178.00 = 1391.00 FEET.

FLOW PROCESS FROM NODE 178.00 TO NODE 179.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 2 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 68.00 DOWNSTREAM ELEVATION(FEET) = 66.00

STREET LENGTH(FEET) = 1457.00 CURB HEIGHT(INCHES) = 8.0

STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 60.95

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.93

HALFSTREET FLOOD WIDTH(FEET) = 51.77

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.81

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.69

STREET FLOW TRAVEL TIME(MIN.) = 13.40 Tc(MIN.) = 29.40

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.471

SUBAREA LOSS RATE DATA(AMC II):

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

"5-7 DWELLINGS/ACRE" B 15.00 0.30 0.500 56

COMMERCIAL B 14.20 0.30 0.100 56

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.305

GC10

SUBAREA AREA(ACRES) = 29.20 SUBAREA RUNOFF(CFS) = 36.25
 EFFECTIVE AREA(ACRES) = 53.60 AREA-AVERAGED Fm(INCH/HR) = 0.11
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.38
 TOTAL AREA(ACRES) = 53.6 PEAK FLOW RATE(CFS) = 65.50

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.95 HALFSTREET FLOOD WIDTH(FEET) = 53.74
 FLOW VELOCITY(FEET/SEC.) = 1.83 DEPTH*VELOCITY(FT*FT/SEC.) = 1.74
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 1457.0 FT WITH ELEVATION-DROP = 2.0 FT, IS 44.6 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 179.00
 LONGEST FLOWPATH FROM NODE 175.00 TO NODE 179.00 = 2848.00 FEET.

FLOW PROCESS FROM NODE 179.00 TO NODE 180.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 2 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 66.00 DOWNSTREAM ELEVATION(FEET) = 65.50
 STREET LENGTH(FEET) = 1087.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 81.22
 STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 1.16
 HALFSTREET FLOOD WIDTH(FEET) = 66.91
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.31
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.52
 STREET FLOW TRAVEL TIME(MIN.) = 13.84 Tc(MIN.) = 43.24
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.179

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	2.90	0.30	0.500	56
COMMERCIAL	B	5.40	0.30	0.100	56
COMMERCIAL	C	0.30	0.25	0.100	69
URBAN POOR COVER					
"TURF"	B	19.10	0.30	1.000	74
SCHOOL	B	7.60	0.30	0.600	56
SCHOOL	C	0.80	0.25	0.600	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.725
 SUBAREA AREA(ACRES) = 36.10 SUBAREA RUNOFF(CFS) = 31.27
 EFFECTIVE AREA(ACRES) = 89.70 AREA-AVERAGED Fm(INCH/HR) = 0.15
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.52
 TOTAL AREA(ACRES) = 89.7 PEAK FLOW RATE(CFS) = 82.70

END OF SUBAREA STREET FLOW HYDRAULICS:

GC10

DEPTH(FEET) = 1.17 HALFSTREET FLOOD WIDTH(FEET) = 67.22
FLOW VELOCITY(FEET/SEC.) = 1.32 DEPTH*VELOCITY(FT*FT/SEC.) = 1.54
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 1087.0 FT WITH ELEVATION-DROP = 0.5 FT, IS 47.7 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 180.00
LONGEST FLOWPATH FROM NODE 175.00 TO NODE 180.00 = 3935.00 FEET.

FLOW PROCESS FROM NODE 180.00 TO NODE 181.00 IS CODE = 31

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

=====
ELEVATION DATA: UPSTREAM(FEET) = 65.50 DOWNSTREAM(FEET) = 65.00
FLOW LENGTH(FEET) = 61.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 42.0 INCH PIPE IS 32.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 10.23
ESTIMATED PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 82.70
PIPE TRAVEL TIME(MIN.) = 0.10 Tc(MIN.) = 43.34
LONGEST FLOWPATH FROM NODE 175.00 TO NODE 181.00 = 3996.00 FEET.

+-----+
| END OF SYSTEM |
+-----+

FLOW PROCESS FROM NODE 181.10 TO NODE 181.20 IS CODE = 21

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

=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 75.00 DOWNSTREAM(FEET) = 74.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.862
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751

SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)
RESIDENTIAL
"5-7 DWELLINGS/ACRE" C 0.60 0.25 0.500 69 12.62
COMMERCIAL C 1.30 0.25 0.100 69 9.86
URBAN POOR COVER
"TURF" C 0.20 0.25 1.000 83 17.03
SCHOOL C 2.10 0.25 0.600 69 13.37
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.450
SUBAREA RUNOFF(CFS) = 9.97
TOTAL AREA(ACRES) = 4.20 PEAK FLOW RATE(CFS) = 9.97

FLOW PROCESS FROM NODE 181.20 TO NODE 181.30 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 2 USED)<<<<<

GC10

UPSTREAM ELEVATION(FEET) = 74.00 DOWNSTREAM ELEVATION(FEET) = 72.50
STREET LENGTH(FEET) = 711.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 17.65
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.61
HALFSTREET FLOOD WIDTH(FEET) = 22.44
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.69
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.03
STREET FLOW TRAVEL TIME(MIN.) = 7.01 Tc(MIN.) = 16.87
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.022

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	5.30	0.25	0.500	69
COMMERCIAL	C	2.50	0.25	0.100	69
SCHOOL	C	1.00	0.25	0.600	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.398
SUBAREA AREA(ACRES) = 8.80 SUBAREA RUNOFF(CFS) = 15.23
EFFECTIVE AREA(ACRES) = 13.00 AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.41
TOTAL AREA(ACRES) = 13.0 PEAK FLOW RATE(CFS) = 22.44

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.65 HALFSTREET FLOOD WIDTH(FEET) = 24.65
FLOW VELOCITY(FEET/SEC.) = 1.79 DEPTH*VELOCITY(FT*FT/SEC.) = 1.17
LONGEST FLOWPATH FROM NODE 181.10 TO NODE 181.30 = 1041.00 FEET.

FLOW PROCESS FROM NODE 181.30 TO NODE 181.40 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 2 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 72.50 DOWNSTREAM ELEVATION(FEET) = 72.00
STREET LENGTH(FEET) = 216.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 39.68

GC10

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.76
HALFSTREET FLOOD WIDTH(FEET) = 34.71
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.10
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.60
STREET FLOW TRAVEL TIME(MIN.) = 1.71 Tc(MIN.) = 18.59
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.913

SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Rows include RESIDENTIAL, COMMERCIAL, and URBAN POOR COVER.

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.425
SUBAREA AREA(ACRES) = 21.20 SUBAREA RUNOFF(CFS) = 34.47
EFFECTIVE AREA(ACRES) = 34.20 AREA-AVERAGED Fm(INCH/HR) = 0.11
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.42
TOTAL AREA(ACRES) = 34.2 PEAK FLOW RATE(CFS) = 55.64

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.84 HALFSTREET FLOOD WIDTH(FEET) = 42.75
FLOW VELOCITY(FEET/SEC.) = 2.22 DEPTH*VELOCITY(FT*FT/SEC.) = 1.86
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 216.0 FT WITH ELEVATION-DROP = 0.5 FT, IS 54.0 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 181.40
LONGEST FLOWPATH FROM NODE 181.10 TO NODE 181.40 = 1257.00 FEET.

FLOW PROCESS FROM NODE 181.40 TO NODE 181.50 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 2 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 72.00 DOWNSTREAM ELEVATION(FEET) = 69.00
STREET LENGTH(FEET) = 690.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 74.39

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.83
HALFSTREET FLOOD WIDTH(FEET) = 42.09
AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.03
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.52
STREET FLOW TRAVEL TIME(MIN.) = 3.80 Tc(MIN.) = 22.38
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.720

SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN.

GC10

RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 5.60 0.30 0.500 56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" C 13.70 0.25 0.500 69
 COMMERCIAL B 1.80 0.30 0.100 56
 COMMERCIAL C 4.70 0.25 0.100 69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.399
 SUBAREA AREA(ACRES) = 25.80 SUBAREA RUNOFF(CFS) = 37.48
 EFFECTIVE AREA(ACRES) = 60.00 AREA-AVERAGED Fm(INCH/HR) = 0.11
 AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.41
 TOTAL AREA(ACRES) = 60.0 PEAK FLOW RATE(CFS) = 87.17

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.87 HALFSTREET FLOOD WIDTH(FEET) = 46.03
 FLOW VELOCITY(FEET/SEC.) = 3.11 DEPTH*VELOCITY(FT*FT/SEC.) = 2.71
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 690.0 FT WITH ELEVATION-DROP = 3.0 FT, IS 53.8 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 181.50
 LONGEST FLOWPATH FROM NODE 181.10 TO NODE 181.50 = 1947.00 FEET.

FLOW PROCESS FROM NODE 181.50 TO NODE 181.60 IS CODE = 62

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 2 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 69.00 DOWNSTREAM ELEVATION(FEET) = 66.50
 STREET LENGTH(FEET) = 623.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 105.55
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.93
 HALFSTREET FLOOD WIDTH(FEET) = 52.10
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.11
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.90
 STREET FLOW TRAVEL TIME(MIN.) = 3.34 Tc(MIN.) = 25.73
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.588

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	5.60	0.30	0.500	56
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	12.90	0.25	0.500	69
COMMERCIAL	B	3.80	0.30	0.100	56
COMMERCIAL	C	5.10	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.370
 SUBAREA AREA(ACRES) = 27.40 SUBAREA RUNOFF(CFS) = 36.73

GC10

EFFECTIVE AREA(ACRES) = 87.40 AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.40
TOTAL AREA(ACRES) = 87.4 PEAK FLOW RATE(CFS) = 116.79

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.96 HALFSTREET FLOOD WIDTH(FEET) = 54.89
FLOW VELOCITY(FEET/SEC.) = 3.16 DEPTH*VELOCITY(FT*FT/SEC.) = 3.04
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 623.0 FT WITH ELEVATION-DROP = 2.5 FT, IS 58.1 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 181.60
LONGEST FLOWPATH FROM NODE 181.10 TO NODE 181.60 = 2570.00 FEET.

FLOW PROCESS FROM NODE 181.60 TO NODE 181.70 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 66.50 DOWNSTREAM(FEET) = 66.00
FLOW LENGTH(FEET) = 93.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 51.0 INCH PIPE IS 41.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 9.44
ESTIMATED PIPE DIAMETER(INCH) = 51.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 116.79
PIPE TRAVEL TIME(MIN.) = 0.16 Tc(MIN.) = 25.89
LONGEST FLOWPATH FROM NODE 181.10 TO NODE 181.70 = 2663.00 FEET.

END OF SYSTEM

FLOW PROCESS FROM NODE 182.00 TO NODE 183.00 IS CODE = 21

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 62.50 DOWNSTREAM(FEET) = 62.00

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

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.329

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.541

SUBAREA Tc AND LOSS RATE DATA(AMC II):

Table with 7 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN, Tc (MIN.). Rows include RESIDENTIAL, '5-7 DWELLINGS/ACRE', and COMMERCIAL.

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.367

SUBAREA RUNOFF(CFS) = 3.94

TOTAL AREA(ACRES) = 1.80 PEAK FLOW RATE(CFS) = 3.94

FLOW PROCESS FROM NODE 183.00 TO NODE 184.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

GC10

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 62.00 DOWNSTREAM ELEVATION(FEET) = 61.00
STREET LENGTH(FEET) = 513.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.50
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.42
HALFSTREET FLOOD WIDTH(FEET) = 15.43
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.29
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.55
STREET FLOW TRAVEL TIME(MIN.) = 6.65 Tc(MIN.) = 17.98
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.950

SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN
RESIDENTIAL
"5-7 DWELLINGS/ACRE" B 2.40 0.30 0.500 56
COMMERCIAL B 0.70 0.30 0.100 56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.410
SUBAREA AREA(ACRES) = 3.10 SUBAREA RUNOFF(CFS) = 5.10
EFFECTIVE AREA(ACRES) = 4.90 AREA-AVERAGED Fm(INCH/HR) = 0.12
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.39
TOTAL AREA(ACRES) = 4.9 PEAK FLOW RATE(CFS) = 8.08

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.45 HALFSTREET FLOOD WIDTH(FEET) = 16.84
FLOW VELOCITY(FEET/SEC.) = 1.35 DEPTH*VELOCITY(FT*FT/SEC.) = 0.61
LONGEST FLOWPATH FROM NODE 182.00 TO NODE 184.00 = 843.00 FEET.

FLOW PROCESS FROM NODE 184.00 TO NODE 185.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 61.00 DOWNSTREAM ELEVATION(FEET) = 60.00
STREET LENGTH(FEET) = 574.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

GC10

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.87

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.57

HALFSTREET FLOOD WIDTH(FEET) = 23.28

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.61

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.91

STREET FLOW TRAVEL TIME(MIN.) = 5.95 Tc(MIN.) = 23.93

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.655

SUBAREA LOSS RATE DATA(AMC II):

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

"5-7 DWELLINGS/ACRE" B 8.70 0.30 0.500 56

COMMERCIAL B 3.90 0.30 0.100 56

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.376

SUBAREA AREA(ACRES) = 12.60 SUBAREA RUNOFF(CFS) = 17.49

EFFECTIVE AREA(ACRES) = 17.50 AREA-AVERAGED Fm(INCH/HR) = 0.11

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.38

TOTAL AREA(ACRES) = 17.5 PEAK FLOW RATE(CFS) = 24.27

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.63 HALFSTREET FLOOD WIDTH(FEET) = 26.28

FLOW VELOCITY(FEET/SEC.) = 1.80 DEPTH*VELOCITY(FT*FT/SEC.) = 1.13

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 574.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 24.5 CFS,

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 185.00

LONGEST FLOWPATH FROM NODE 182.00 TO NODE 185.00 = 1417.00 FEET.

FLOW PROCESS FROM NODE 185.00 TO NODE 186.00 IS CODE = 31

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

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 60.00 DOWNSTREAM(FEET) = 59.00

FLOW LENGTH(FEET) = 580.00 MANNING'S N = 0.013

DEPTH OF FLOW IN 36.0 INCH PIPE IS 27.3 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 4.22

ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) = 24.27

PIPE TRAVEL TIME(MIN.) = 2.29 Tc(MIN.) = 26.22

LONGEST FLOWPATH FROM NODE 182.00 TO NODE 186.00 = 1997.00 FEET.

FLOW PROCESS FROM NODE 186.00 TO NODE 186.00 IS CODE = 81

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

MAINLINE Tc(MIN.) = 26.22

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.571

SUBAREA LOSS RATE DATA(AMC II):

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

"5-7 DWELLINGS/ACRE" B 10.20 0.30 0.500 56

COMMERCIAL B 5.20 0.30 0.100 56

URBAN POOR COVER

"TURF" B 0.20 0.30 1.000 74

GC10

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.373
 SUBAREA AREA(ACRES) = 15.60 SUBAREA RUNOFF(CFS) = 20.48
 EFFECTIVE AREA(ACRES) = 33.10 AREA-AVERAGED Fm(INCH/HR) = 0.11
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.38
 TOTAL AREA(ACRES) = 33.1 PEAK FLOW RATE(CFS) = 43.42

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| END OF SYSTEM |
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 FLOW PROCESS FROM NODE 187.00 TO NODE 188.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 72.00 DOWNSTREAM(FEET) = 70.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.586
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	1.60	0.25	0.500	69	10.99
COMMERCIAL	C	5.80	0.25	0.100	69	8.59

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.186
 SUBAREA RUNOFF(CFS) = 19.52
 TOTAL AREA(ACRES) = 7.40 PEAK FLOW RATE(CFS) = 19.52

FLOW PROCESS FROM NODE 188.00 TO NODE 189.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 70.00 DOWNSTREAM ELEVATION(FEET) = 68.00
 STREET LENGTH(FEET) = 447.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.51

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.59
 HALFSTREET FLOOD WIDTH(FEET) = 24.44

GC10

AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.72
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.60
 STREET FLOW TRAVEL TIME(MIN.) = 2.74 Tc(MIN.) = 11.33
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.541
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	3.60	0.25	0.500	69
COMMERCIAL	C	7.10	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.235
 SUBAREA AREA(ACRES) = 10.70 SUBAREA RUNOFF(CFS) = 23.90
 EFFECTIVE AREA(ACRES) = 18.10 AREA-AVERAGED Fm(INCH/HR) = 0.05
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.21
 TOTAL AREA(ACRES) = 18.1 PEAK FLOW RATE(CFS) = 40.51

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.63 HALFSTREET FLOOD WIDTH(FEET) = 26.64
 FLOW VELOCITY(FEET/SEC.) = 2.93 DEPTH*VELOCITY(FT*FT/SEC.) = 1.85
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 447.0 FT WITH ELEVATION-DROP = 2.0 FT, IS 25.3 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 189.00
 LONGEST FLOWPATH FROM NODE 187.00 TO NODE 189.00 = 777.00 FEET.

FLOW PROCESS FROM NODE 189.00 TO NODE 190.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 68.00 DOWNSTREAM ELEVATION(FEET) = 63.00
 STREET LENGTH(FEET) = 1345.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 69.18

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.77
 HALFSTREET FLOOD WIDTH(FEET) = 33.42
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.15
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.42
 STREET FLOW TRAVEL TIME(MIN.) = 7.12 Tc(MIN.) = 18.45
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.921

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	5.70	0.30	0.500	56
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	14.70	0.25	0.500	69

GC10

COMMERCIAL	B	2.20	0.30	0.100	56
COMMERCIAL	C	11.90	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.337
SUBAREA AREA(ACRES) = 34.50 SUBAREA RUNOFF(CFS) = 56.90
EFFECTIVE AREA(ACRES) = 52.60 AREA-AVERAGED Fm(INCH/HR) = 0.08
AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.29
TOTAL AREA(ACRES) = 52.6 PEAK FLOW RATE(CFS) = 87.33

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.83 HALFSTREET FLOOD WIDTH(FEET) = 36.47
FLOW VELOCITY(FEET/SEC.) = 3.33 DEPTH*VELOCITY(FT*FT/SEC.) = 2.76
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 1345.0 FT WITH ELEVATION-DROP = 5.0 FT, IS 60.6 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 190.00
LONGEST FLOWPATH FROM NODE 187.00 TO NODE 190.00 = 2122.00 FEET.

FLOW PROCESS FROM NODE 190.00 TO NODE 194.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 63.00 DOWNSTREAM(FEET) = 62.00
FLOW LENGTH(FEET) = 522.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 57.0 INCH PIPE IS 43.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.04
ESTIMATED PIPE DIAMETER(INCH) = 57.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 87.33
PIPE TRAVEL TIME(MIN.) = 1.44 Tc(MIN.) = 19.89
LONGEST FLOWPATH FROM NODE 187.00 TO NODE 194.00 = 2644.00 FEET.

FLOW PROCESS FROM NODE 194.00 TO NODE 194.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 19.89
RAINFALL INTENSITY(INCH/HR) = 1.84
AREA-AVERAGED Fm(INCH/HR) = 0.08
AREA-AVERAGED Fp(INCH/HR) = 0.26
AREA-AVERAGED Ap = 0.29
EFFECTIVE STREAM AREA(ACRES) = 52.60
TOTAL STREAM AREA(ACRES) = 52.60
PEAK FLOW RATE(CFS) AT CONFLUENCE = 87.33

FLOW PROCESS FROM NODE 191.00 TO NODE 192.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 68.00 DOWNSTREAM(FEET) = 66.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.586
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978

GC10

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	B	1.90	0.30	0.500	56	10.99
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	0.50	0.25	0.500	69	10.99
COMMERCIAL	B	0.50	0.30	0.100	56	8.59
COMMERCIAL	C	0.10	0.25	0.100	69	8.59

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.29
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.420
 SUBAREA RUNOFF(CFS) = 7.71
 TOTAL AREA(ACRES) = 3.00 PEAK FLOW RATE(CFS) = 7.71

FLOW PROCESS FROM NODE 192.00 TO NODE 193.00 IS CODE = 62

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 66.00 DOWNSTREAM ELEVATION(FEET) = 64.00
 STREET LENGTH(FEET) = 548.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 13.59
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.48
 HALFSTREET FLOOD WIDTH(FEET) = 18.32
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.94
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.94
 STREET FLOW TRAVEL TIME(MIN.) = 4.71 Tc(MIN.) = 13.29
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.318

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	4.30	0.30	0.500	56
COMMERCIAL	B	1.60	0.30	0.100	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.392
 SUBAREA AREA(ACRES) = 5.90 SUBAREA RUNOFF(CFS) = 11.68
 EFFECTIVE AREA(ACRES) = 8.90 AREA-AVERAGED Fm(INCH/HR) = 0.12
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.40
 TOTAL AREA(ACRES) = 8.9 PEAK FLOW RATE(CFS) = 17.62

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.52 HALFSTREET FLOOD WIDTH(FEET) = 21.03
 FLOW VELOCITY(FEET/SEC.) = 2.08 DEPTH*VELOCITY(FT*FT/SEC.) = 1.08
 LONGEST FLOWPATH FROM NODE 191.00 TO NODE 193.00 = 878.00 FEET.

GC10

FLOW PROCESS FROM NODE 193.00 TO NODE 194.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<<

UPSTREAM ELEVATION(FEET) = 64.00 DOWNSTREAM ELEVATION(FEET) = 62.00
STREET LENGTH(FEET) = 767.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25.30
STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.60

HALFSTREET FLOOD WIDTH(FEET) = 24.87

AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.11

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.26

STREET FLOW TRAVEL TIME(MIN.) = 6.07 Tc(MIN.) = 19.37

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.869

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	6.90	0.30	0.500	56
COMMERCIAL	B	2.80	0.30	0.100	56

"5-7 DWELLINGS/ACRE"

COMMERCIAL

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.385

SUBAREA AREA(ACRES) = 9.70 SUBAREA RUNOFF(CFS) = 15.31

EFFECTIVE AREA(ACRES) = 18.60 AREA-AVERAGED Fm(INCH/HR) = 0.12

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.39

TOTAL AREA(ACRES) = 18.6 PEAK FLOW RATE(CFS) = 29.32

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.62 HALFSTREET FLOOD WIDTH(FEET) = 26.15

FLOW VELOCITY(FEET/SEC.) = 2.20 DEPTH*VELOCITY(FT*FT/SEC.) = 1.37

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 767.0 FT WITH ELEVATION-DROP = 2.0 FT, IS 18.4 CFS,

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 194.00

LONGEST FLOWPATH FROM NODE 191.00 TO NODE 194.00 = 1645.00 FEET.

FLOW PROCESS FROM NODE 194.00 TO NODE 194.00 IS CODE = 1

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

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 19.37

RAINFALL INTENSITY(INCH/HR) = 1.87

AREA-AVERAGED Fm(INCH/HR) = 0.12

AREA-AVERAGED Fp(INCH/HR) = 0.30

GC10

AREA-AVERAGED Ap = 0.39
EFFECTIVE STREAM AREA(ACRES) = 18.60
TOTAL STREAM AREA(ACRES) = 18.60
PEAK FLOW RATE(CFS) AT CONFLUENCE = 29.32

** CONFLUENCE DATA **

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 1 and 2.

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

** PEAK FLOW RATE TABLE **

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 1 and 2.

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 116.17 Tc(MIN.) = 19.89
EFFECTIVE AREA(ACRES) = 71.20 AREA-AVERAGED Fm(INCH/HR) = 0.09
AREA-AVERAGED Fp(INCH/HR) = 0.27 AREA-AVERAGED Ap = 0.32
TOTAL AREA(ACRES) = 71.2
LONGEST FLOWPATH FROM NODE 187.00 TO NODE 194.00 = 2644.00 FEET.

FLOW PROCESS FROM NODE 194.00 TO NODE 198.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 62.00 DOWNSTREAM(FEET) = 61.00
FLOW LENGTH(FEET) = 265.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 57.0 INCH PIPE IS 41.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 8.43
ESTIMATED PIPE DIAMETER(INCH) = 57.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 116.17
PIPE TRAVEL TIME(MIN.) = 0.52 Tc(MIN.) = 20.41
LONGEST FLOWPATH FROM NODE 187.00 TO NODE 198.00 = 2909.00 FEET.

FLOW PROCESS FROM NODE 198.00 TO NODE 198.00 IS CODE = 1

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

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 20.41
RAINFALL INTENSITY(INCH/HR) = 1.81
AREA-AVERAGED Fm(INCH/HR) = 0.09
AREA-AVERAGED Fp(INCH/HR) = 0.27
AREA-AVERAGED Ap = 0.32
EFFECTIVE STREAM AREA(ACRES) = 71.20
TOTAL STREAM AREA(ACRES) = 71.20
PEAK FLOW RATE(CFS) AT CONFLUENCE = 116.17

FLOW PROCESS FROM NODE 195.00 TO NODE 196.00 IS CODE = 21

GC10

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 66.00 DOWNSTREAM(FEET) = 64.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.586
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	B	1.40	0.30	0.500	56	10.99
COMMERCIAL	B	0.70	0.30	0.100	56	8.59
URBAN POOR COVER						
"TURF"	B	0.40	0.30	1.000	74	14.83

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.468

SUBAREA RUNOFF(CFS) = 6.38

TOTAL AREA(ACRES) = 2.50 PEAK FLOW RATE(CFS) = 6.38

FLOW PROCESS FROM NODE 196.00 TO NODE 197.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 64.00 DOWNSTREAM ELEVATION(FEET) = 62.00
 STREET LENGTH(FEET) = 384.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.23

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.41

HALFSTREET FLOOD WIDTH(FEET) = 14.57

AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.03

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.83

STREET FLOW TRAVEL TIME(MIN.) = 3.15 Tc(MIN.) = 11.73

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.490

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	1.80	0.30	0.500	56
COMMERCIAL	B	0.50	0.30	0.100	56
URBAN POOR COVER					
"TURF"	B	0.40	0.30	1.000	74

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.500

GC10

SUBAREA AREA(ACRES) = 2.70 SUBAREA RUNOFF(CFS) = 5.69
EFFECTIVE AREA(ACRES) = 5.20 AREA-AVERAGED Fm(INCH/HR) = 0.15
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.48
TOTAL AREA(ACRES) = 5.2 PEAK FLOW RATE(CFS) = 10.97

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.43 HALFSTREET FLOOD WIDTH(FEET) = 15.66
FLOW VELOCITY(FEET/SEC.) = 2.11 DEPTH*VELOCITY(FT*FT/SEC.) = 0.91
LONGEST FLOWPATH FROM NODE 195.00 TO NODE 197.00 = 714.00 FEET.

FLOW PROCESS FROM NODE 197.00 TO NODE 198.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 62.00 DOWNSTREAM ELEVATION(FEET) = 61.00
STREET LENGTH(FEET) = 585.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14.40
STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.54
HALFSTREET FLOOD WIDTH(FEET) = 22.19
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.52
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.82
STREET FLOW TRAVEL TIME(MIN.) = 6.43 Tc(MIN.) = 18.16
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.939

SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Rows include RESIDENTIAL, COMMERCIAL, and URBAN POOR COVER.

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.455
SUBAREA AREA(ACRES) = 4.20 SUBAREA RUNOFF(CFS) = 6.81
EFFECTIVE AREA(ACRES) = 9.40 AREA-AVERAGED Fm(INCH/HR) = 0.14
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.47
TOTAL AREA(ACRES) = 9.4 PEAK FLOW RATE(CFS) = 15.21

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.55 HALFSTREET FLOOD WIDTH(FEET) = 22.55
FLOW VELOCITY(FEET/SEC.) = 1.55 DEPTH*VELOCITY(FT*FT/SEC.) = 0.85
LONGEST FLOWPATH FROM NODE 195.00 TO NODE 198.00 = 1299.00 FEET.

FLOW PROCESS FROM NODE 198.00 TO NODE 198.00 IS CODE = 1

GC10

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

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 18.16
 RAINFALL INTENSITY(INCH/HR) = 1.94
 AREA-AVERAGED Fm(INCH/HR) = 0.14
 AREA-AVERAGED Fp(INCH/HR) = 0.30
 AREA-AVERAGED Ap = 0.47
 EFFECTIVE STREAM AREA(ACRES) = 9.40
 TOTAL STREAM AREA(ACRES) = 9.40
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 15.21

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	115.72	19.89	1.840	0.27(0.09)	0.32	69.8	191.00
1	116.17	20.41	1.813	0.27(0.09)	0.32	71.2	187.00
2	15.21	18.16	1.939	0.30(0.14)	0.47	9.4	195.00

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	126.79	18.16	1.939	0.28(0.09)	0.34	73.1	195.00
2	130.09	19.89	1.840	0.28(0.09)	0.34	79.2	191.00
3	130.32	20.41	1.813	0.28(0.09)	0.34	80.6	187.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 130.32 Tc(MIN.) = 20.41
 EFFECTIVE AREA(ACRES) = 80.60 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.28 AREA-AVERAGED Ap = 0.34
 TOTAL AREA(ACRES) = 80.6
 LONGEST FLOWPATH FROM NODE 187.00 TO NODE 198.00 = 2909.00 FEET.

 FLOW PROCESS FROM NODE 198.00 TO NODE 199.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 61.00 DOWNSTREAM(FEET) = 60.00
 FLOW LENGTH(FEET) = 169.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 54.0 INCH PIPE IS 40.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 10.22
 ESTIMATED PIPE DIAMETER(INCH) = 54.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 130.32
 PIPE TRAVEL TIME(MIN.) = 0.28 Tc(MIN.) = 20.69
 LONGEST FLOWPATH FROM NODE 187.00 TO NODE 199.00 = 3078.00 FEET.

+-----+
 | END OF SYSTEM |
 | |
 +-----+

GC10

FLOW PROCESS FROM NODE 200.00 TO NODE 201.00 IS CODE = 21

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 64.00 DOWNSTREAM(FEET) = 62.00

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

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.586

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	B	2.20	0.30	0.500	56	10.99
COMMERCIAL	B	1.40	0.30	0.100	56	8.59
SCHOOL	B	4.30	0.30	0.600	56	11.64

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.484

SUBAREA RUNOFF(CFS) = 20.14

TOTAL AREA(ACRES) = 7.90 PEAK FLOW RATE(CFS) = 20.14

FLOW PROCESS FROM NODE 201.00 TO NODE 202.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 62.00 DOWNSTREAM ELEVATION(FEET) = 61.00
STREET LENGTH(FEET) = 464.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 28.57

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.64

HALFSTREET FLOOD WIDTH(FEET) = 26.76

AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.05

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.30

STREET FLOW TRAVEL TIME(MIN.) = 3.78 Tc(MIN.) = 12.37

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.416

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	2.70	0.30	0.500	56
COMMERCIAL	B	1.70	0.30	0.100	56
SCHOOL	B	3.80	0.30	0.600	56

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

GC10

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.463
SUBAREA AREA(ACRES) = 8.20 SUBAREA RUNOFF(CFS) = 16.80
EFFECTIVE AREA(ACRES) = 16.10 AREA-AVERAGED Fm(INCH/HR) = 0.14
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.47
TOTAL AREA(ACRES) = 16.1 PEAK FLOW RATE(CFS) = 32.95

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 28.17
FLOW VELOCITY(FEET/SEC.) = 2.12 DEPTH*VELOCITY(FT*FT/SEC.) = 1.41
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 464.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 17.0 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 202.00
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 202.00 = 794.00 FEET.

FLOW PROCESS FROM NODE 202.00 TO NODE 203.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 61.00 DOWNSTREAM ELEVATION(FEET) = 60.00
STREET LENGTH(FEET) = 647.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 43.89
STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.76
HALFSTREET FLOOD WIDTH(FEET) = 33.23
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.02
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.54
STREET FLOW TRAVEL TIME(MIN.) = 5.34 Tc(MIN.) = 17.71
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.967

SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Rows include RESIDENTIAL and COMMERCIAL categories.

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.390
SUBAREA AREA(ACRES) = 13.10 SUBAREA RUNOFF(CFS) = 21.81
EFFECTIVE AREA(ACRES) = 29.20 AREA-AVERAGED Fm(INCH/HR) = 0.13
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.44
TOTAL AREA(ACRES) = 29.2 PEAK FLOW RATE(CFS) = 48.25

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.79 HALFSTREET FLOOD WIDTH(FEET) = 34.39
FLOW VELOCITY(FEET/SEC.) = 2.07 DEPTH*VELOCITY(FT*FT/SEC.) = 1.63
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 647.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 24.3 CFS,

GC10

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 203.00
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 203.00 = 1441.00 FEET.

FLOW PROCESS FROM NODE 203.00 TO NODE 204.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 60.00 DOWNSTREAM(FEET) = 58.00
FLOW LENGTH(FEET) = 728.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 42.0 INCH PIPE IS 33.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.92
ESTIMATED PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 48.25
PIPE TRAVEL TIME(MIN.) = 2.05 Tc(MIN.) = 19.76
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 204.00 = 2169.00 FEET.

FLOW PROCESS FROM NODE 204.00 TO NODE 204.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN.) = 19.76
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.847
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	15.50	0.30	0.500	56
COMMERCIAL	B	3.80	0.30	0.100	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.421
SUBAREA AREA(ACRES) = 19.30 SUBAREA RUNOFF(CFS) = 29.89
EFFECTIVE AREA(ACRES) = 48.50 AREA-AVERAGED Fm(INCH/HR) = 0.13
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.43
TOTAL AREA(ACRES) = 48.5 PEAK FLOW RATE(CFS) = 75.00

FLOW PROCESS FROM NODE 204.00 TO NODE 209.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 58.00 DOWNSTREAM(FEET) = 57.00
FLOW LENGTH(FEET) = 437.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 51.0 INCH PIPE IS 40.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.16
ESTIMATED PIPE DIAMETER(INCH) = 51.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 75.00
PIPE TRAVEL TIME(MIN.) = 1.18 Tc(MIN.) = 20.94
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 209.00 = 2606.00 FEET.

FLOW PROCESS FROM NODE 209.00 TO NODE 209.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

GC10

TIME OF CONCENTRATION(MIN.) = 20.94
 RAINFALL INTENSITY(INCH/HR) = 1.79
 AREA-AVERAGED Fm(INCH/HR) = 0.13
 AREA-AVERAGED Fp(INCH/HR) = 0.30
 AREA-AVERAGED Ap = 0.43
 EFFECTIVE STREAM AREA(ACRES) = 48.50
 TOTAL STREAM AREA(ACRES) = 48.50
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 75.00

FLOW PROCESS FROM NODE 205.00 TO NODE 206.00 IS CODE = 21

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 66.00 DOWNSTREAM(FEET) = 65.00

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.862

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	B	4.50	0.30	0.500	56	12.62
COMMERCIAL	B	2.10	0.30	0.100	56	9.86

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.373

SUBAREA RUNOFF(CFS) = 15.67

TOTAL AREA(ACRES) = 6.60 PEAK FLOW RATE(CFS) = 15.67

FLOW PROCESS FROM NODE 206.00 TO NODE 207.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 65.00 DOWNSTREAM ELEVATION(FEET) = 64.00
 STREET LENGTH(FEET) = 487.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 24.87

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.61

HALFSTREET FLOOD WIDTH(FEET) = 25.73

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.93

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.19

STREET FLOW TRAVEL TIME(MIN.) = 4.20 Tc(MIN.) = 14.07

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.244

GC10

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	7.50	0.30	0.500	56
COMMERCIAL	B	2.10	0.30	0.100	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.412
 SUBAREA AREA(ACRES) = 9.60 SUBAREA RUNOFF(CFS) = 18.32
 EFFECTIVE AREA(ACRES) = 16.20 AREA-AVERAGED Fm(INCH/HR) = 0.12
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.40
 TOTAL AREA(ACRES) = 16.2 PEAK FLOW RATE(CFS) = 30.99

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 27.80
 FLOW VELOCITY(FEET/SEC.) = 2.05 DEPTH*VELOCITY(FT*FT/SEC.) = 1.35
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 487.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 19.7 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 207.00
 LONGEST FLOWPATH FROM NODE 205.00 TO NODE 207.00 = 817.00 FEET.

FLOW PROCESS FROM NODE 207.00 TO NODE 208.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 64.00 DOWNSTREAM ELEVATION(FEET) = 60.00
 STREET LENGTH(FEET) = 1239.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 42.51

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.67
 HALFSTREET FLOOD WIDTH(FEET) = 28.72
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.63
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.78
 STREET FLOW TRAVEL TIME(MIN.) = 7.84 Tc(MIN.) = 21.91
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.741

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	11.60	0.30	0.500	56
COMMERCIAL	B	4.10	0.30	0.100	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.396
 SUBAREA AREA(ACRES) = 15.70 SUBAREA RUNOFF(CFS) = 22.93
 EFFECTIVE AREA(ACRES) = 31.90 AREA-AVERAGED Fm(INCH/HR) = 0.12
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.40

GC10
TOTAL AREA(ACRES) = 31.9 PEAK FLOW RATE(CFS) = 46.58

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.69 HALFSTREET FLOOD WIDTH(FEET) = 29.63
FLOW VELOCITY(FEET/SEC.) = 2.71 DEPTH*VELOCITY(FT*FT/SEC.) = 1.88
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 1239.0 FT WITH ELEVATION-DROP = 4.0 FT, IS 27.2 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 208.00
LONGEST FLOWPATH FROM NODE 205.00 TO NODE 208.00 = 2056.00 FEET.

FLOW PROCESS FROM NODE 208.00 TO NODE 209.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 60.00 DOWNSTREAM ELEVATION(FEET) = 57.00
STREET LENGTH(FEET) = 1850.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 57.02
STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.83
HALFSTREET FLOOD WIDTH(FEET) = 36.29
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.20
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.81
STREET FLOW TRAVEL TIME(MIN.) = 14.05 Tc(MIN.) = 35.95
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.311

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	5.60	0.30	0.500	56
COMMERCIAL	B	8.30	0.30	0.100	56
SCHOOL	B	5.30	0.30	0.600	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.355
SUBAREA AREA(ACRES) = 19.20 SUBAREA RUNOFF(CFS) = 20.81
EFFECTIVE AREA(ACRES) = 51.10 AREA-AVERAGED Fm(INCH/HR) = 0.11
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.38
TOTAL AREA(ACRES) = 51.1 PEAK FLOW RATE(CFS) = 55.04

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.82 HALFSTREET FLOOD WIDTH(FEET) = 35.86
FLOW VELOCITY(FEET/SEC.) = 2.17 DEPTH*VELOCITY(FT*FT/SEC.) = 1.77
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 1850.0 FT WITH ELEVATION-DROP = 3.0 FT, IS 28.0 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 209.00
LONGEST FLOWPATH FROM NODE 205.00 TO NODE 209.00 = 3906.00 FEET.

GC10

FLOW PROCESS FROM NODE 209.00 TO NODE 209.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 35.95
 RAINFALL INTENSITY(INCH/HR) = 1.31
 AREA-AVERAGED Fm(INCH/HR) = 0.11
 AREA-AVERAGED Fp(INCH/HR) = 0.30
 AREA-AVERAGED Ap = 0.38
 EFFECTIVE STREAM AREA(ACRES) = 51.10
 TOTAL STREAM AREA(ACRES) = 51.10
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 55.04

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	75.00	20.94	1.787	0.30(0.13)	0.43	48.5	200.00
2	55.04	35.95	1.311	0.30(0.11)	0.38	51.1	205.00

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	119.81	20.94	1.787	0.30(0.12)	0.41	78.3	200.00
2	108.51	35.95	1.311	0.30(0.12)	0.40	99.6	205.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 119.81 Tc(MIN.) = 20.94
 EFFECTIVE AREA(ACRES) = 78.26 AREA-AVERAGED Fm(INCH/HR) = 0.12
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.41
 TOTAL AREA(ACRES) = 99.6
 LONGEST FLOWPATH FROM NODE 205.00 TO NODE 209.00 = 3906.00 FEET.

FLOW PROCESS FROM NODE 209.00 TO NODE 210.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 57.00 DOWNSTREAM(FEET) = 56.50
 FLOW LENGTH(FEET) = 1315.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 87.0 INCH PIPE IS 66.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 3.57
 ESTIMATED PIPE DIAMETER(INCH) = 87.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 119.81
 PIPE TRAVEL TIME(MIN.) = 6.14 Tc(MIN.) = 27.08
 LONGEST FLOWPATH FROM NODE 205.00 TO NODE 210.00 = 5221.00 FEET.

FLOW PROCESS FROM NODE 210.00 TO NODE 210.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN.) = 27.08

GC10

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.542

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	10.90	0.30	0.500	56
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	3.00	0.25	0.500	69
COMMERCIAL	B	3.50	0.30	0.100	56
COMMERCIAL	C	3.50	0.25	0.100	69
URBAN POOR COVER					
"TURF"	C	0.30	0.25	1.000	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.29

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.375

SUBAREA AREA(ACRES) = 21.20 SUBAREA RUNOFF(CFS) = 27.37

EFFECTIVE AREA(ACRES) = 99.46 AREA-AVERAGED Fm(INCH/HR) = 0.12

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.40

TOTAL AREA(ACRES) = 120.8 PEAK FLOW RATE(CFS) = 127.29

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| END OF SYSTEM
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FLOW PROCESS FROM NODE 210.10 TO NODE 210.20 IS CODE = 21

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

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00

ELEVATION DATA: UPSTREAM(FEET) = 60.00 DOWNSTREAM(FEET) = 59.50

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

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.329

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.541

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	B	1.10	0.30	0.500	56	14.50
COMMERCIAL	B	0.50	0.30	0.100	56	11.33

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.375

SUBAREA RUNOFF(CFS) = 3.50

TOTAL AREA(ACRES) = 1.60 PEAK FLOW RATE(CFS) = 3.50

FLOW PROCESS FROM NODE 210.20 TO NODE 210.30 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 59.50 DOWNSTREAM ELEVATION(FEET) = 59.00

STREET LENGTH(FEET) = 538.00 CURB HEIGHT(INCHES) = 6.0

STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

GC10

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.79

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.46

HALFSTREET FLOOD WIDTH(FEET) = 17.07

AVERAGE FLOW VELOCITY(FEET/SEC.) = 0.95

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.43

STREET FLOW TRAVEL TIME(MIN.) = 9.49 Tc(MIN.) = 20.82

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.793

SUBAREA LOSS RATE DATA(AMC II):

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

"5-7 DWELLINGS/ACRE" B 2.10 0.30 0.500 56

COMMERCIAL B 0.90 0.30 0.100 56

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

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.380

SUBAREA AREA(ACRES) = 3.00 SUBAREA RUNOFF(CFS) = 4.53

EFFECTIVE AREA(ACRES) = 4.60 AREA-AVERAGED Fm(INCH/HR) = 0.11

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.38

TOTAL AREA(ACRES) = 4.6 PEAK FLOW RATE(CFS) = 6.95

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 18.40

FLOW VELOCITY(FEET/SEC.) = 0.98 DEPTH*VELOCITY(FT*FT/SEC.) = 0.48

LONGEST FLOWPATH FROM NODE 210.10 TO NODE 210.30 = 868.00 FEET.

FLOW PROCESS FROM NODE 210.30 TO NODE 210.40 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 59.00 DOWNSTREAM ELEVATION(FEET) = 58.00

STREET LENGTH(FEET) = 325.00 CURB HEIGHT(INCHES) = 6.0

STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.91

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.45

HALFSTREET FLOOD WIDTH(FEET) = 16.68

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.69

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.76

STREET FLOW TRAVEL TIME(MIN.) = 3.20 Tc(MIN.) = 24.02

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.652

GC10

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	3.30	0.30	0.500	56
COMMERCIAL	B	1.00	0.30	0.100	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.407
SUBAREA AREA(ACRES) = 4.30 SUBAREA RUNOFF(CFS) = 5.92
EFFECTIVE AREA(ACRES) = 8.90 AREA-AVERAGED Fm(INCH/HR) = 0.12
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.39
TOTAL AREA(ACRES) = 8.9 PEAK FLOW RATE(CFS) = 12.29

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 18.16
FLOW VELOCITY(FEET/SEC.) = 1.78 DEPTH*VELOCITY(FT*FT/SEC.) = 0.85
LONGEST FLOWPATH FROM NODE 210.10 TO NODE 210.40 = 1193.00 FEET.

FLOW PROCESS FROM NODE 210.40 TO NODE 210.50 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 58.00 DOWNSTREAM ELEVATION(FEET) = 57.50
STREET LENGTH(FEET) = 619.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.45
STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.62
HALFSTREET FLOOD WIDTH(FEET) = 26.21
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.23
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.77
STREET FLOW TRAVEL TIME(MIN.) = 8.40 Tc(MIN.) = 32.42
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.391

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	4.40	0.30	0.500	56
COMMERCIAL	B	2.60	0.30	0.100	56
URBAN POOR COVER					
"TURF"	B	0.20	0.30	1.000	74

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.369
SUBAREA AREA(ACRES) = 7.20 SUBAREA RUNOFF(CFS) = 8.30
EFFECTIVE AREA(ACRES) = 16.10 AREA-AVERAGED Fm(INCH/HR) = 0.11
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.38
TOTAL AREA(ACRES) = 16.1 PEAK FLOW RATE(CFS) = 18.49

GC10

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.65 HALFSTREET FLOOD WIDTH(FEET) = 27.31
 FLOW VELOCITY(FEET/SEC.) = 1.27 DEPTH*VELOCITY(FT*FT/SEC.) = 0.82

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 619.0 FT WITH ELEVATION-DROP = 0.5 FT, IS 12.5 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 210.50
 LONGEST FLOWPATH FROM NODE 210.10 TO NODE 210.50 = 1812.00 FEET.

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+-----+
| END OF SYSTEM                                     |
+-----+
    
```

FLOW PROCESS FROM NODE 211.00 TO NODE 212.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 67.00 DOWNSTREAM(FEET) = 66.00

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 9.862

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751

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.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	1.60	0.25	0.500	69	12.62
COMMERCIAL	C	0.50	0.25	0.100	69	9.86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.405

SUBAREA RUNOFF(CFS) = 5.01

TOTAL AREA(ACRES) = 2.10 PEAK FLOW RATE(CFS) = 5.01

FLOW PROCESS FROM NODE 212.00 TO NODE 213.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 66.00 DOWNSTREAM ELEVATION(FEET) = 64.00
 STREET LENGTH(FEET) = 523.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.20

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.45

GC10

HALFSTREET FLOOD WIDTH(FEET) = 16.76
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.89
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.86
 STREET FLOW TRAVEL TIME(MIN.) = 4.60 Tc(MIN.) = 14.46
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.209
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	4.80	0.25	0.500	69
COMMERCIAL	C	1.60	0.25	0.100	69
URBAN POOR COVER					
"TURF"	C	0.10	0.25	1.000	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.409
 SUBAREA AREA(ACRES) = 6.50 SUBAREA RUNOFF(CFS) = 12.32
 EFFECTIVE AREA(ACRES) = 8.60 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.41
 TOTAL AREA(ACRES) = 8.6 PEAK FLOW RATE(CFS) = 16.31

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.51 HALFSTREET FLOOD WIDTH(FEET) = 19.80
 FLOW VELOCITY(FEET/SEC.) = 2.07 DEPTH*VELOCITY(FT*FT/SEC.) = 1.05
 LONGEST FLOWPATH FROM NODE 211.00 TO NODE 213.00 = 853.00 FEET.

FLOW PROCESS FROM NODE 213.00 TO NODE 214.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 64.00 DOWNSTREAM ELEVATION(FEET) = 60.00
 STREET LENGTH(FEET) = 1186.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 27.79

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.59
 HALFSTREET FLOOD WIDTH(FEET) = 24.57
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.37
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.40
 STREET FLOW TRAVEL TIME(MIN.) = 8.33 Tc(MIN.) = 22.80
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.702

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	11.50	0.25	0.500	69
COMMERCIAL	C	4.20	0.25	0.100	69
URBAN POOR COVER					

GC10

"TURF" C 0.10 0.25 1.000 83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.397

SUBAREA AREA(ACRES) = 15.80 SUBAREA RUNOFF(CFS) = 22.79

EFFECTIVE AREA(ACRES) = 24.40 AREA-AVERAGED Fm(INCH/HR) = 0.10

AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.40

TOTAL AREA(ACRES) = 24.4 PEAK FLOW RATE(CFS) = 35.17

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.63 HALFSTREET FLOOD WIDTH(FEET) = 26.64

FLOW VELOCITY(FEET/SEC.) = 2.54 DEPTH*VELOCITY(FT*FT/SEC.) = 1.61

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 1186.0 FT WITH ELEVATION-DROP = 4.0 FT, IS 28.1 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 214.00

LONGEST FLOWPATH FROM NODE 211.00 TO NODE 214.00 = 2039.00 FEET.

FLOW PROCESS FROM NODE 214.00 TO NODE 214.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 22.80

RAINFALL INTENSITY(INCH/HR) = 1.70

AREA-AVERAGED Fm(INCH/HR) = 0.10

AREA-AVERAGED Fp(INCH/HR) = 0.25

AREA-AVERAGED Ap = 0.40

EFFECTIVE STREAM AREA(ACRES) = 24.40

TOTAL STREAM AREA(ACRES) = 24.40

PEAK FLOW RATE(CFS) AT CONFLUENCE = 35.17

FLOW PROCESS FROM NODE 215.00 TO NODE 216.00 IS CODE = 21

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

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00

ELEVATION DATA: UPSTREAM(FEET) = 68.00 DOWNSTREAM(FEET) = 66.00

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

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.586

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	0.20	0.25	0.500	69	10.99
COMMERCIAL	C	1.50	0.25	0.100	69	8.59

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.147

SUBAREA RUNOFF(CFS) = 4.50

TOTAL AREA(ACRES) = 1.70 PEAK FLOW RATE(CFS) = 4.50

FLOW PROCESS FROM NODE 216.00 TO NODE 217.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

GC10

=====

UPSTREAM ELEVATION(FEET) = 66.00 DOWNSTREAM ELEVATION(FEET) = 62.00
 STREET LENGTH(FEET) = 970.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8.04
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.41
 HALFSTREET FLOOD WIDTH(FEET) = 14.49
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.79
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.73
 STREET FLOW TRAVEL TIME(MIN.) = 9.04 Tc(MIN.) = 17.63
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.972

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	3.80	0.25	0.100	69
URBAN POOR COVER "TURF"	C	0.20	0.25	1.000	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.145
 SUBAREA AREA(ACRES) = 4.00 SUBAREA RUNOFF(CFS) = 6.97
 EFFECTIVE AREA(ACRES) = 5.70 AREA-AVERAGED Fm(INCH/HR) = 0.04
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.15
 TOTAL AREA(ACRES) = 5.7 PEAK FLOW RATE(CFS) = 9.93

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.43 HALFSTREET FLOOD WIDTH(FEET) = 15.74
 FLOW VELOCITY(FEET/SEC.) = 1.89 DEPTH*VELOCITY(FT*FT/SEC.) = 0.82
 LONGEST FLOWPATH FROM NODE 215.00 TO NODE 217.00 = 1300.00 FEET.

FLOW PROCESS FROM NODE 217.00 TO NODE 214.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 62.00 DOWNSTREAM(FEET) = 60.00
 FLOW LENGTH(FEET) = 1132.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 27.0 INCH PIPE IS 18.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 3.45
 ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 9.93
 PIPE TRAVEL TIME(MIN.) = 5.46 Tc(MIN.) = 23.09
 LONGEST FLOWPATH FROM NODE 215.00 TO NODE 214.00 = 2432.00 FEET.

FLOW PROCESS FROM NODE 214.00 TO NODE 214.00 IS CODE = 1

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

GC10

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=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 23.09
RAINFALL INTENSITY(INCH/HR) = 1.69
AREA-AVERAGED Fm(INCH/HR) = 0.04
AREA-AVERAGED Fp(INCH/HR) = 0.25
AREA-AVERAGED Ap = 0.15
EFFECTIVE STREAM AREA(ACRES) = 5.70
TOTAL STREAM AREA(ACRES) = 5.70
PEAK FLOW RATE(CFS) AT CONFLUENCE = 9.93
    
```

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	35.17	22.80	1.702	0.25(0.10)	0.40	24.4	211.00
2	9.93	23.09	1.689	0.25(0.04)	0.15	5.7	215.00

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	45.05	22.80	1.702	0.25(0.09)	0.35	30.0	211.00
2	44.83	23.09	1.689	0.25(0.09)	0.35	30.1	215.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

```

PEAK FLOW RATE(CFS) = 45.05 Tc(MIN.) = 22.80
EFFECTIVE AREA(ACRES) = 30.03 AREA-AVERAGED Fm(INCH/HR) = 0.09
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.35
TOTAL AREA(ACRES) = 30.1
LONGEST FLOWPATH FROM NODE 215.00 TO NODE 214.00 = 2432.00 FEET.
    
```

FLOW PROCESS FROM NODE 214.00 TO NODE 222.00 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) = 60.00 DOWNSTREAM(FEET) = 58.00
FLOW LENGTH(FEET) = 1041.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 45.0 INCH PIPE IS 33.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.15
ESTIMATED PIPE DIAMETER(INCH) = 45.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 45.05
PIPE TRAVEL TIME(MIN.) = 3.37 Tc(MIN.) = 26.17
LONGEST FLOWPATH FROM NODE 215.00 TO NODE 222.00 = 3473.00 FEET.
    
```

FLOW PROCESS FROM NODE 222.00 TO NODE 222.00 IS CODE = 1

```

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

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=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 26.17
RAINFALL INTENSITY(INCH/HR) = 1.57
AREA-AVERAGED Fm(INCH/HR) = 0.09
AREA-AVERAGED Fp(INCH/HR) = 0.25
    
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GC10

AREA-AVERAGED Ap = 0.35
EFFECTIVE STREAM AREA(ACRES) = 30.03
TOTAL STREAM AREA(ACRES) = 30.10
PEAK FLOW RATE(CFS) AT CONFLUENCE = 45.05

FLOW PROCESS FROM NODE 218.00 TO NODE 219.00 IS CODE = 21

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 62.00 DOWNSTREAM(FEET) = 61.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.862
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751

SUBAREA Tc AND LOSS RATE DATA(AMC II):

Table with 7 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN, Tc (MIN.). Rows include RESIDENTIAL and COMMERCIAL.

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.344

SUBAREA RUNOFF(CFS) = 4.32

TOTAL AREA(ACRES) = 1.80 PEAK FLOW RATE(CFS) = 4.32

FLOW PROCESS FROM NODE 219.00 TO NODE 220.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 2 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 61.00 DOWNSTREAM ELEVATION(FEET) = 60.00
STREET LENGTH(FEET) = 301.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.80

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.45

HALFSTREET FLOOD WIDTH(FEET) = 14.73

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.65

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.75

STREET FLOW TRAVEL TIME(MIN.) = 3.04 Tc(MIN.) = 12.90

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.359

SUBAREA LOSS RATE DATA(AMC II):

Table with 7 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Row includes RESIDENTIAL.

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COMMERCIAL C 1.20 0.25 0.100 69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.359
 SUBAREA AREA(ACRES) = 3.40 SUBAREA RUNOFF(CFS) = 6.94
 EFFECTIVE AREA(ACRES) = 5.20 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.35
 TOTAL AREA(ACRES) = 5.2 PEAK FLOW RATE(CFS) = 10.62

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.49 HALFSTREET FLOOD WIDTH(FEET) = 16.73
 FLOW VELOCITY(FEET/SEC.) = 1.78 DEPTH*VELOCITY(FT*FT/SEC.) = 0.88
 LONGEST FLOWPATH FROM NODE 218.00 TO NODE 220.00 = 631.00 FEET.

FLOW PROCESS FROM NODE 220.00 TO NODE 221.00 IS CODE = 62

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 2 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 60.00 DOWNSTREAM ELEVATION(FEET) = 59.00
 STREET LENGTH(FEET) = 680.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 15.10
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.61
 HALFSTREET FLOOD WIDTH(FEET) = 22.68
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.42
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.87
 STREET FLOW TRAVEL TIME(MIN.) = 8.01 Tc(MIN.) = 20.90
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.789

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	3.30	0.25	0.500	69
COMMERCIAL	C	2.50	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.328
 SUBAREA AREA(ACRES) = 5.80 SUBAREA RUNOFF(CFS) = 8.91
 EFFECTIVE AREA(ACRES) = 11.00 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.34
 TOTAL AREA(ACRES) = 11.0 PEAK FLOW RATE(CFS) = 16.86

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.63 HALFSTREET FLOOD WIDTH(FEET) = 23.67
 FLOW VELOCITY(FEET/SEC.) = 1.46 DEPTH*VELOCITY(FT*FT/SEC.) = 0.92
 LONGEST FLOWPATH FROM NODE 218.00 TO NODE 221.00 = 1311.00 FEET.

FLOW PROCESS FROM NODE 221.00 TO NODE 222.00 IS CODE = 62

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 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 2 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 59.00 DOWNSTREAM ELEVATION(FEET) = 58.00
 STREET LENGTH(FEET) = 915.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 29.20
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.78
 HALFSTREET FLOOD WIDTH(FEET) = 36.35
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.46
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.13
 STREET FLOW TRAVEL TIME(MIN.) = 10.47 Tc(MIN.) = 31.38
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.417

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	15.20	0.25	0.500	69
COMMERCIAL	C	5.50	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.394
 SUBAREA AREA(ACRES) = 20.70 SUBAREA RUNOFF(CFS) = 24.57
 EFFECTIVE AREA(ACRES) = 31.70 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.38
 TOTAL AREA(ACRES) = 31.7 PEAK FLOW RATE(CFS) = 37.76

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.84 HALFSTREET FLOOD WIDTH(FEET) = 42.42
 FLOW VELOCITY(FEET/SEC.) = 1.52 DEPTH*VELOCITY(FT*FT/SEC.) = 1.27
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 915.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 34.3 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 222.00
 LONGEST FLOWPATH FROM NODE 218.00 TO NODE 222.00 = 2226.00 FEET.

FLOW PROCESS FROM NODE 222.00 TO NODE 222.00 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.) = 31.38
 RAINFALL INTENSITY(INCH/HR) = 1.42
 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.38
 EFFECTIVE STREAM AREA(ACRES) = 31.70

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TOTAL STREAM AREA(ACRES) = 31.70
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 37.76

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	45.05	26.17	1.573	0.25(0.09)	0.35	30.0	211.00
1	44.83	26.46	1.563	0.25(0.09)	0.35	30.1	215.00
2	37.76	31.38	1.417	0.25(0.09)	0.38	31.7	218.00

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	80.23	26.17	1.573	0.25(0.09)	0.36	56.5	211.00
2	80.17	26.46	1.563	0.25(0.09)	0.36	56.8	215.00
3	78.17	31.38	1.417	0.25(0.09)	0.36	61.8	218.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 80.23 Tc(MIN.) = 26.17
 EFFECTIVE AREA(ACRES) = 56.46 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.36
 TOTAL AREA(ACRES) = 61.8
 LONGEST FLOWPATH FROM NODE 215.00 TO NODE 222.00 = 3473.00 FEET.

 FLOW PROCESS FROM NODE 222.00 TO NODE 227.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 58.00 DOWNSTREAM(FEET) = 57.00
 FLOW LENGTH(FEET) = 411.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 54.0 INCH PIPE IS 39.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.52
 ESTIMATED PIPE DIAMETER(INCH) = 54.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 80.23
 PIPE TRAVEL TIME(MIN.) = 1.05 Tc(MIN.) = 27.22
 LONGEST FLOWPATH FROM NODE 215.00 TO NODE 227.00 = 3884.00 FEET.

 FLOW PROCESS FROM NODE 227.00 TO NODE 227.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION(MIN.) = 27.22
 RAINFALL INTENSITY(INCH/HR) = 1.54
 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.36
 EFFECTIVE STREAM AREA(ACRES) = 56.46
 TOTAL STREAM AREA(ACRES) = 61.80
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 80.23

 FLOW PROCESS FROM NODE 223.00 TO NODE 224.00 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) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 63.00 DOWNSTREAM(FEET) = 62.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.862
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	B	0.50	0.30	0.500	56	12.62
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	1.60	0.25	0.500	69	12.62
COMMERCIAL	B	0.20	0.30	0.100	56	9.86
COMMERCIAL	C	0.70	0.25	0.100	69	9.86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.380

SUBAREA RUNOFF(CFS) = 7.16

TOTAL AREA(ACRES) = 3.00 PEAK FLOW RATE(CFS) = 7.16

FLOW PROCESS FROM NODE 224.00 TO NODE 225.00 IS CODE = 62

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<
 =====

UPSTREAM ELEVATION(FEET) = 62.00 DOWNSTREAM ELEVATION(FEET) = 59.00
 STREET LENGTH(FEET) = 749.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.62

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.44

HALFSTREET FLOOD WIDTH(FEET) = 16.29

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.89

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.84

STREET FLOW TRAVEL TIME(MIN.) = 6.59 Tc(MIN.) = 16.45

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.052

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	2.70	0.25	0.500	69
COMMERCIAL	C	1.20	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.377

SUBAREA AREA(ACRES) = 3.90 SUBAREA RUNOFF(CFS) = 6.87

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EFFECTIVE AREA(ACRES) = 6.90 AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.38
TOTAL AREA(ACRES) = 6.9 PEAK FLOW RATE(CFS) = 12.14

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.46 HALFSTREET FLOOD WIDTH(FEET) = 17.15
FLOW VELOCITY(FEET/SEC.) = 1.97 DEPTH*VELOCITY(FT*FT/SEC.) = 0.90
LONGEST FLOWPATH FROM NODE 223.00 TO NODE 225.00 = 1079.00 FEET.

FLOW PROCESS FROM NODE 225.00 TO NODE 226.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 59.00 DOWNSTREAM ELEVATION(FEET) = 58.00
STREET LENGTH(FEET) = 381.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.95

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.55
HALFSTREET FLOOD WIDTH(FEET) = 22.61
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.92
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.06
STREET FLOW TRAVEL TIME(MIN.) = 3.31 Tc(MIN.) = 19.76
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.847

SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Rows include Residential (5-7 Dwellings/Acre) and Commercial (B and C).

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.403
SUBAREA AREA(ACRES) = 8.70 SUBAREA RUNOFF(CFS) = 13.60
EFFECTIVE AREA(ACRES) = 15.60 AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.27 AREA-AVERAGED Ap = 0.39
TOTAL AREA(ACRES) = 15.6 PEAK FLOW RATE(CFS) = 24.47

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 24.57
FLOW VELOCITY(FEET/SEC.) = 2.09 DEPTH*VELOCITY(FT*FT/SEC.) = 1.24
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 381.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 19.6 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 226.00
LONGEST FLOWPATH FROM NODE 223.00 TO NODE 226.00 = 1460.00 FEET.

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 FLOW PROCESS FROM NODE 226.00 TO NODE 227.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 58.00 DOWNSTREAM ELEVATION(FEET) = 57.00
 STREET LENGTH(FEET) = 714.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 37.15
 STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.74
 HALFSTREET FLOOD WIDTH(FEET) = 31.77
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.87
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.38
 STREET FLOW TRAVEL TIME(MIN.) = 6.35 Tc(MIN.) = 26.11
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.575

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	4.80	0.30	0.500	56
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	10.90	0.25	0.500	69
COMMERCIAL	B	1.50	0.30	0.100	56
COMMERCIAL	C	1.10	0.25	0.100	69
URBAN POOR COVER					
"TURF"	B	0.50	0.30	1.000	74
URBAN POOR COVER					
"TURF"	C	0.60	0.25	1.000	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.475
 SUBAREA AREA(ACRES) = 19.40 SUBAREA RUNOFF(CFS) = 25.28
 EFFECTIVE AREA(ACRES) = 35.00 AREA-AVERAGED Fm(INCH/HR) = 0.12
 AREA-AVERAGED Fp(INCH/HR) = 0.27 AREA-AVERAGED Ap = 0.44
 TOTAL AREA(ACRES) = 35.0 PEAK FLOW RATE(CFS) = 45.93

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.79 HALFSTREET FLOOD WIDTH(FEET) = 34.39
 FLOW VELOCITY(FEET/SEC.) = 1.97 DEPTH*VELOCITY(FT*FT/SEC.) = 1.55
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 714.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 34.6 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 227.00
 LONGEST FLOWPATH FROM NODE 223.00 TO NODE 227.00 = 2174.00 FEET.

 FLOW PROCESS FROM NODE 227.00 TO NODE 227.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 26.11
 RAINFALL INTENSITY(INCH/HR) = 1.57
 AREA-AVERAGED Fm(INCH/HR) = 0.12
 AREA-AVERAGED Fp(INCH/HR) = 0.27
 AREA-AVERAGED Ap = 0.44
 EFFECTIVE STREAM AREA(ACRES) = 35.00
 TOTAL STREAM AREA(ACRES) = 35.00
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 45.93

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	80.23	27.22	1.538	0.25(0.09)	0.36	56.5	211.00
1	80.17	27.51	1.528	0.25(0.09)	0.36	56.8	215.00
1	78.17	32.46	1.390	0.25(0.09)	0.36	61.8	218.00
2	45.93	26.11	1.575	0.27(0.12)	0.44	35.0	223.00

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	124.87	26.11	1.575	0.26(0.10)	0.39	89.2	223.00
2	124.99	27.22	1.538	0.26(0.10)	0.39	91.5	211.00
3	124.63	27.51	1.528	0.26(0.10)	0.39	91.8	215.00
4	118.28	32.46	1.390	0.26(0.10)	0.39	96.8	218.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 124.99 Tc(MIN.) = 27.22
 EFFECTIVE AREA(ACRES) = 91.46 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.39
 TOTAL AREA(ACRES) = 96.8
 LONGEST FLOWPATH FROM NODE 215.00 TO NODE 227.00 = 3884.00 FEET.

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+-----+
| END OF SYSTEM |
+-----+
  
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FLOW PROCESS FROM NODE 228.00 TO NODE 229.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 56.00 DOWNSTREAM(FEET) = 54.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.586
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS	Tc
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GC10

LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN	(MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	B	1.80	0.30	0.500	56	10.99
COMMERCIAL	B	0.70	0.30	0.100	56	8.59
SCHOOL	B	2.20	0.30	0.600	56	11.64

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.487
SUBAREA RUNOFF(CFS) = 11.98
TOTAL AREA(ACRES) = 4.70 PEAK FLOW RATE(CFS) = 11.98

FLOW PROCESS FROM NODE 229.00 TO NODE 230.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 54.00 DOWNSTREAM ELEVATION(FEET) = 53.00
STREET LENGTH(FEET) = 580.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.29

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.58

HALFSTREET FLOOD WIDTH(FEET) = 23.89

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.65

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.96

STREET FLOW TRAVEL TIME(MIN.) = 5.85 Tc(MIN.) = 14.43

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.211

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	2.80	0.30	0.500	56
COMMERCIAL	B	1.40	0.30	0.100	56
SCHOOL	B	1.90	0.30	0.600	56
SCHOOL	C	0.60	0.25	0.600	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.29

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.454

SUBAREA AREA(ACRES) = 6.70 SUBAREA RUNOFF(CFS) = 12.53

EFFECTIVE AREA(ACRES) = 11.40 AREA-AVERAGED Fm(INCH/HR) = 0.14

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.47

TOTAL AREA(ACRES) = 11.4 PEAK FLOW RATE(CFS) = 21.27

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.60 HALFSTREET FLOOD WIDTH(FEET) = 25.18

FLOW VELOCITY(FEET/SEC.) = 1.73 DEPTH*VELOCITY(FT*FT/SEC.) = 1.04

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 580.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 12.9 CFS,

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 230.00

LONGEST FLOWPATH FROM NODE 228.00 TO NODE 230.00 = 910.00 FEET.

GC10

 FLOW PROCESS FROM NODE 230.00 TO NODE 234.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 53.00 DOWNSTREAM(FEET) = 52.50
 FLOW LENGTH(FEET) = 1212.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 33.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 2.39
 ESTIMATED PIPE DIAMETER(INCH) = 45.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 21.27
 PIPE TRAVEL TIME(MIN.) = 8.45 Tc(MIN.) = 22.88
 LONGEST FLOWPATH FROM NODE 228.00 TO NODE 234.00 = 2122.00 FEET.

 FLOW PROCESS FROM NODE 234.00 TO NODE 234.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION(MIN.) = 22.88
 RAINFALL INTENSITY(INCH/HR) = 1.70
 AREA-AVERAGED Fm(INCH/HR) = 0.14
 AREA-AVERAGED Fp(INCH/HR) = 0.30
 AREA-AVERAGED Ap = 0.47
 EFFECTIVE STREAM AREA(ACRES) = 11.40
 TOTAL STREAM AREA(ACRES) = 11.40
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 21.27

 FLOW PROCESS FROM NODE 231.00 TO NODE 232.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 56.00 DOWNSTREAM(FEET) = 54.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.586
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978

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.)
URBAN POOR COVER						
"TURF"	C	0.30	0.25	1.000	83	14.83
COMMERCIAL	C	0.60	0.25	0.100	69	8.59
SCHOOL	B	1.80	0.30	0.600	56	11.64
SCHOOL	C	5.30	0.25	0.600	69	11.64

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.578

SUBAREA RUNOFF(CFS) = 20.35

TOTAL AREA(ACRES) = 8.00 PEAK FLOW RATE(CFS) = 20.35

 FLOW PROCESS FROM NODE 232.00 TO NODE 233.00 IS CODE = 62

GC10

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 54.00 DOWNSTREAM ELEVATION(FEET) = 53.00
STREET LENGTH(FEET) = 345.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 29.53
STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.61
HALFSTREET FLOOD WIDTH(FEET) = 25.73
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.29
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.41
STREET FLOW TRAVEL TIME(MIN.) = 2.51 Tc(MIN.) = 11.09
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.571

SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Rows include URBAN POOR COVER, TURF, COMMERCIAL, SCHOOL, SCHOOL.

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.579
SUBAREA AREA(ACRES) = 8.40 SUBAREA RUNOFF(CFS) = 18.33
EFFECTIVE AREA(ACRES) = 16.40 AREA-AVERAGED Fm(INCH/HR) = 0.15
AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.58
TOTAL AREA(ACRES) = 16.4 PEAK FLOW RATE(CFS) = 35.76

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.65 HALFSTREET FLOOD WIDTH(FEET) = 27.50
FLOW VELOCITY(FEET/SEC.) = 2.42 DEPTH*VELOCITY(FT*FT/SEC.) = 1.57
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 345.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 19.4 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 233.00
LONGEST FLOWPATH FROM NODE 231.00 TO NODE 233.00 = 675.00 FEET.

FLOW PROCESS FROM NODE 233.00 TO NODE 234.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 53.00 DOWNSTREAM ELEVATION(FEET) = 52.50
STREET LENGTH(FEET) = 375.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020

GC10

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 49.62

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.81

HALFSTREET FLOOD WIDTH(FEET) = 35.74

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.97

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.60

STREET FLOW TRAVEL TIME(MIN.) = 3.17 Tc(MIN.) = 14.27

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.226

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
URBAN POOR COVER					
"TURF"	C	0.40	0.25	1.000	83
COMMERCIAL	C	0.90	0.25	0.100	69
SCHOOL	B	1.60	0.30	0.600	56
SCHOOL	C	11.90	0.25	0.600	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.580

SUBAREA AREA(ACRES) = 14.80 SUBAREA RUNOFF(CFS) = 27.68

EFFECTIVE AREA(ACRES) = 31.20 AREA-AVERAGED Fm(INCH/HR) = 0.15

AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.58

TOTAL AREA(ACRES) = 31.2 PEAK FLOW RATE(CFS) = 58.34

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.86 HALFSTREET FLOOD WIDTH(FEET) = 37.99

FLOW VELOCITY(FEET/SEC.) = 2.05 DEPTH*VELOCITY(FT*FT/SEC.) = 1.76

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 375.0 FT WITH ELEVATION-DROP = 0.5 FT, IS 30.4 CFS,

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 234.00

LONGEST FLOWPATH FROM NODE 231.00 TO NODE 234.00 = 1050.00 FEET.

FLOW PROCESS FROM NODE 234.00 TO NODE 234.00 IS CODE = 1

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

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 14.27

RAINFALL INTENSITY(INCH/HR) = 2.23

AREA-AVERAGED Fm(INCH/HR) = 0.15

AREA-AVERAGED Fp(INCH/HR) = 0.26

AREA-AVERAGED Ap = 0.58

EFFECTIVE STREAM AREA(ACRES) = 31.20

TOTAL STREAM AREA(ACRES) = 31.20

PEAK FLOW RATE(CFS) AT CONFLUENCE = 58.34

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap (DECIMAL)	Ae (ACRES)	HEADWATER NODE
1	21.27	22.88	1.698	0.30(0.14)	0.47	11.4	228.00

GC10
TOTAL AREA(ACRES) = 3.40 PEAK FLOW RATE(CFS) = 8.09

FLOW PROCESS FROM NODE 237.00 TO NODE 238.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 57.00 DOWNSTREAM ELEVATION(FEET) = 55.00
STREET LENGTH(FEET) = 436.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.85
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.46
HALFSTREET FLOOD WIDTH(FEET) = 17.07
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.10
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.96
STREET FLOW TRAVEL TIME(MIN.) = 3.46 Tc(MIN.) = 13.33
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.315

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	2.00	0.25	0.500	69
COMMERCIAL	C	2.70	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.270
SUBAREA AREA(ACRES) = 4.70 SUBAREA RUNOFF(CFS) = 9.51
EFFECTIVE AREA(ACRES) = 8.10 AREA-AVERAGED Fm(INCH/HR) = 0.08
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.34
TOTAL AREA(ACRES) = 8.1 PEAK FLOW RATE(CFS) = 16.26

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.49 HALFSTREET FLOOD WIDTH(FEET) = 18.79
FLOW VELOCITY(FEET/SEC.) = 2.21 DEPTH*VELOCITY(FT*FT/SEC.) = 1.09
LONGEST FLOWPATH FROM NODE 236.00 TO NODE 238.00 = 766.00 FEET.

FLOW PROCESS FROM NODE 238.00 TO NODE 239.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 55.00 DOWNSTREAM ELEVATION(FEET) = 52.00
STREET LENGTH(FEET) = 915.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

GC10

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 21.68
STREET FLOWING FULL
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.56
HALFSTREET FLOOD WIDTH(FEET) = 22.80
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.16
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.20
STREET FLOW TRAVEL TIME(MIN.) = 7.06 Tc(MIN.) = 20.39
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.814

SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"5-7 DWELLINGS/ACRE" C 5.50 0.25 0.500 69
COMMERCIAL C 1.50 0.25 0.100 69
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.414
SUBAREA AREA(ACRES) = 7.00 SUBAREA RUNOFF(CFS) = 10.78
EFFECTIVE AREA(ACRES) = 15.10 AREA-AVERAGED Fm(INCH/HR) = 0.09
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.37
TOTAL AREA(ACRES) = 15.1 PEAK FLOW RATE(CFS) = 23.39

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.57 HALFSTREET FLOOD WIDTH(FEET) = 23.35
FLOW VELOCITY(FEET/SEC.) = 2.22 DEPTH*VELOCITY(FT*FT/SEC.) = 1.26
LONGEST FLOWPATH FROM NODE 236.00 TO NODE 239.00 = 1681.00 FEET.

FLOW PROCESS FROM NODE 239.00 TO NODE 240.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 52.00 DOWNSTREAM ELEVATION(FEET) = 51.50
STREET LENGTH(FEET) = 610.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 32.86
STREET FLOWING FULL
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.77
HALFSTREET FLOOD WIDTH(FEET) = 33.54
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.48
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.14
STREET FLOW TRAVEL TIME(MIN.) = 6.85 Tc(MIN.) = 27.24

GC10

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.537

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	10.50	0.25	0.500	69
COMMERCIAL	C	4.00	0.25	0.100	69
URBAN POOR COVER					
"TURF"	C	0.10	0.25	1.000	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.394

SUBAREA AREA(ACRES) = 14.60 SUBAREA RUNOFF(CFS) = 18.90

EFFECTIVE AREA(ACRES) = 29.70 AREA-AVERAGED Fm(INCH/HR) = 0.10

AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.38

TOTAL AREA(ACRES) = 29.7 PEAK FLOW RATE(CFS) = 38.52

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.81 HALFSTREET FLOOD WIDTH(FEET) = 35.61

FLOW VELOCITY(FEET/SEC.) = 1.54 DEPTH*VELOCITY(FT*FT/SEC.) = 1.25

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 610.0 FT WITH ELEVATION-DROP = 0.5 FT, IS 25.7 CFS,

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 240.00

LONGEST FLOWPATH FROM NODE 236.00 TO NODE 240.00 = 2291.00 FEET.

FLOW PROCESS FROM NODE 240.00 TO NODE 241.00 IS CODE = 31

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

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 51.50 DOWNSTREAM(FEET) = 51.00

FLOW LENGTH(FEET) = 131.00 MANNING'S N = 0.013

DEPTH OF FLOW IN 36.0 INCH PIPE IS 29.0 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 6.30

ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) = 38.52

PIPE TRAVEL TIME(MIN.) = 0.35 Tc(MIN.) = 27.58

LONGEST FLOWPATH FROM NODE 236.00 TO NODE 241.00 = 2422.00 FEET.

END OF SYSTEM

FLOW PROCESS FROM NODE 242.00 TO NODE 243.00 IS CODE = 21

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

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00

ELEVATION DATA: UPSTREAM(FEET) = 54.00 DOWNSTREAM(FEET) = 53.00

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

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.862

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751

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.)

GC10

RESIDENTIAL
 "5-7 DWELLINGS/ACRE" C 1.70 0.25 0.500 69 12.62
 COMMERCIAL C 0.50 0.25 0.100 69 9.86
 URBAN POOR COVER
 "TURF" C 0.20 0.25 1.000 83 17.03
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.458
 SUBAREA RUNOFF(CFS) = 5.69
 TOTAL AREA(ACRES) = 2.40 PEAK FLOW RATE(CFS) = 5.69

FLOW PROCESS FROM NODE 243.00 TO NODE 244.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 53.00 DOWNSTREAM ELEVATION(FEET) = 52.00
 STREET LENGTH(FEET) = 412.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.96
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.49
 HALFSTREET FLOOD WIDTH(FEET) = 18.87
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.61
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.80
 STREET FLOW TRAVEL TIME(MIN.) = 4.26 Tc(MIN.) = 14.12
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.239

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	4.50	0.25	0.500	69
COMMERCIAL	C	1.60	0.25	0.100	69
URBAN POOR COVER					
"TURF"	C	0.40	0.25	1.000	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.432
 SUBAREA AREA(ACRES) = 6.50 SUBAREA RUNOFF(CFS) = 12.47
 EFFECTIVE AREA(ACRES) = 8.90 AREA-AVERAGED Fm(INCH/HR) = 0.11
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.44
 TOTAL AREA(ACRES) = 8.9 PEAK FLOW RATE(CFS) = 17.06

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.54 HALFSTREET FLOOD WIDTH(FEET) = 22.12
 FLOW VELOCITY(FEET/SEC.) = 1.81 DEPTH*VELOCITY(FT*FT/SEC.) = 0.98

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 412.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 14.3 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 244.00
 LONGEST FLOWPATH FROM NODE 242.00 TO NODE 244.00 = 742.00 FEET.

GC10

FLOW PROCESS FROM NODE 244.00 TO NODE 245.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 52.00 DOWNSTREAM(FEET) = 51.00
 FLOW LENGTH(FEET) = 169.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 27.0 INCH PIPE IS 17.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.25
 ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 17.06
 PIPE TRAVEL TIME(MIN.) = 0.45 Tc(MIN.) = 14.57
 LONGEST FLOWPATH FROM NODE 242.00 TO NODE 245.00 = 911.00 FEET.

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 | END OF SYSTEM |
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FLOW PROCESS FROM NODE 246.00 TO NODE 247.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 53.00 DOWNSTREAM(FEET) = 52.50

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.329

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.541

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	0.80	0.25	0.500	69	14.50
COMMERCIAL	C	0.40	0.25	0.100	69	11.33
SCHOOL	B	7.10	0.30	0.600	56	15.35
SCHOOL	C	9.60	0.25	0.600	69	15.35

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.584

SUBAREA RUNOFF(CFS) = 38.38

TOTAL AREA(ACRES) = 17.90 PEAK FLOW RATE(CFS) = 38.38

FLOW PROCESS FROM NODE 247.00 TO NODE 248.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 52.50 DOWNSTREAM ELEVATION(FEET) = 52.00
 STREET LENGTH(FEET) = 587.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

GC10

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 50.07

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.88

HALFSTREET FLOOD WIDTH(FEET) = 39.09

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.66

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.46

STREET FLOW TRAVEL TIME(MIN.) = 5.90 Tc(MIN.) = 17.23

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.998

SUBAREA LOSS RATE DATA(AMC II):

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

"5-7 DWELLINGS/ACRE" C 1.10 0.25 0.500 69

COMMERCIAL C 1.30 0.25 0.100 69

SCHOOL C 11.50 0.25 0.600 69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.545

SUBAREA AREA(ACRES) = 13.90 SUBAREA RUNOFF(CFS) = 23.29

EFFECTIVE AREA(ACRES) = 31.80 AREA-AVERAGED Fm(INCH/HR) = 0.15

AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.57

TOTAL AREA(ACRES) = 31.8 PEAK FLOW RATE(CFS) = 52.93

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.90 HALFSTREET FLOOD WIDTH(FEET) = 39.89

FLOW VELOCITY(FEET/SEC.) = 1.68 DEPTH*VELOCITY(FT*FT/SEC.) = 1.51

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 587.0 FT WITH ELEVATION-DROP = 0.5 FT, IS 24.4 CFS,

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 248.00

LONGEST FLOWPATH FROM NODE 246.00 TO NODE 248.00 = 917.00 FEET.

FLOW PROCESS FROM NODE 248.00 TO NODE 248.50 IS CODE = 31

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

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 52.00 DOWNSTREAM(FEET) = 50.00

FLOW LENGTH(FEET) = 1285.00 MANNING'S N = 0.013

DEPTH OF FLOW IN 48.0 INCH PIPE IS 38.7 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 4.88

ESTIMATED PIPE DIAMETER(INCH) = 48.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) = 52.93

PIPE TRAVEL TIME(MIN.) = 4.39 Tc(MIN.) = 21.62

LONGEST FLOWPATH FROM NODE 246.00 TO NODE 248.50 = 2202.00 FEET.

FLOW PROCESS FROM NODE 248.50 TO NODE 248.50 IS CODE = 81

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

MAINLINE Tc(MIN.) = 21.62

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.754

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
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GC10

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.46

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.46

HALFSTREET FLOOD WIDTH(FEET) = 17.30

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.03

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.48

STREET FLOW TRAVEL TIME(MIN.) = 7.41 Tc(MIN.) = 18.74

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.904

SUBAREA LOSS RATE DATA(AMC II):

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

"5-7 DWELLINGS/ACRE"	C	2.00	0.25	0.500	69
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COMMERCIAL	C	0.80	0.25	0.100	69
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SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.386

SUBAREA AREA(ACRES) = 2.80 SUBAREA RUNOFF(CFS) = 4.56

EFFECTIVE AREA(ACRES) = 4.70 AREA-AVERAGED Fm(INCH/HR) = 0.10

AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.40

TOTAL AREA(ACRES) = 4.7 PEAK FLOW RATE(CFS) = 7.63

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.49 HALFSTREET FLOOD WIDTH(FEET) = 18.48

FLOW VELOCITY(FEET/SEC.) = 1.07 DEPTH*VELOCITY(FT*FT/SEC.) = 0.52

LONGEST FLOWPATH FROM NODE 249.00 TO NODE 251.00 = 787.00 FEET.

FLOW PROCESS FROM NODE 251.00 TO NODE 252.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 49.00 DOWNSTREAM ELEVATION(FEET) = 47.00

STREET LENGTH(FEET) = 920.00 CURB HEIGHT(INCHES) = 6.0

STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.28

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.49

HALFSTREET FLOOD WIDTH(FEET) = 18.79

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.53

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.75

STREET FLOW TRAVEL TIME(MIN.) = 9.99 Tc(MIN.) = 28.73

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.491

SUBAREA LOSS RATE DATA(AMC II):

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

"5-7 DWELLINGS/ACRE"	C	4.20	0.25	0.500	69
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COMMERCIAL	C	1.60	0.25	0.100	69
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GC10

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.390
SUBAREA AREA(ACRES) = 5.80 SUBAREA RUNOFF(CFS) = 7.27
EFFECTIVE AREA(ACRES) = 10.50 AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.39
TOTAL AREA(ACRES) = 10.5 PEAK FLOW RATE(CFS) = 13.16

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.52 HALFSTREET FLOOD WIDTH(FEET) = 20.73
FLOW VELOCITY(FEET/SEC.) = 1.59 DEPTH*VELOCITY(FT*FT/SEC.) = 0.82
LONGEST FLOWPATH FROM NODE 249.00 TO NODE 252.00 = 1707.00 FEET.

FLOW PROCESS FROM NODE 252.00 TO NODE 253.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 47.00 DOWNSTREAM ELEVATION(FEET) = 46.00
STREET LENGTH(FEET) = 756.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.13

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.62
HALFSTREET FLOOD WIDTH(FEET) = 25.85
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.55
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.96
STREET FLOW TRAVEL TIME(MIN.) = 8.14 Tc(MIN.) = 36.87

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.292

SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Rows include RESIDENTIAL, COMMERCIAL, URBAN POOR COVER, and TURF.

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.408
SUBAREA AREA(ACRES) = 13.00 SUBAREA RUNOFF(CFS) = 13.92
EFFECTIVE AREA(ACRES) = 23.50 AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.40
TOTAL AREA(ACRES) = 23.5 PEAK FLOW RATE(CFS) = 25.20

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 27.92
FLOW VELOCITY(FEET/SEC.) = 1.65 DEPTH*VELOCITY(FT*FT/SEC.) = 1.09

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 756.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 23.0 CFS,

GC10

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 253.00
LONGEST FLOWPATH FROM NODE 249.00 TO NODE 253.00 = 2463.00 FEET.

FLOW PROCESS FROM NODE 253.00 TO NODE 253.50 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 46.00 DOWNSTREAM ELEVATION(FEET) = 45.50
STREET LENGTH(FEET) = 172.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.42
STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.63
HALFSTREET FLOOD WIDTH(FEET) = 26.28
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.34
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.46
STREET FLOW TRAVEL TIME(MIN.) = 1.23 Tc(MIN.) = 38.10
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.268

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	8.20	0.25	0.500	69
COMMERCIAL	C	3.40	0.25	0.100	69
URBAN POOR COVER					
"TURF"	C	0.20	0.25	1.000	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.393
SUBAREA AREA(ACRES) = 11.80 SUBAREA RUNOFF(CFS) = 12.42
EFFECTIVE AREA(ACRES) = 35.30 AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.40
TOTAL AREA(ACRES) = 35.3 PEAK FLOW RATE(CFS) = 37.12

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 27.86
FLOW VELOCITY(FEET/SEC.) = 2.45 DEPTH*VELOCITY(FT*FT/SEC.) = 1.61
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 172.0 FT WITH ELEVATION-DROP = 0.5 FT, IS 32.7 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 253.50
LONGEST FLOWPATH FROM NODE 249.00 TO NODE 253.50 = 2635.00 FEET.

FLOW PROCESS FROM NODE 253.50 TO NODE 254.00 IS CODE = 31

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

GC10

ELEVATION DATA: UPSTREAM(FEET) = 45.50 DOWNSTREAM(FEET) = 45.00
FLOW LENGTH(FEET) = 143.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 36.0 INCH PIPE IS 29.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.03
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 37.12
PIPE TRAVEL TIME(MIN.) = 0.39 Tc(MIN.) = 38.49
LONGEST FLOWPATH FROM NODE 249.00 TO NODE 254.00 = 2778.00 FEET.

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| END OF SYSTEM |
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FLOW PROCESS FROM NODE 255.00 TO NODE 256.00 IS CODE = 21

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

=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 50.00 DOWNSTREAM(FEET) = 48.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.586
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978

SUBAREA Tc AND LOSS RATE DATA(AMC II):

Table with 7 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN, Tc (MIN.). Rows include RESIDENTIAL, '5-7 DWELLINGS/ACRE', and COMMERCIAL.

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.360
SUBAREA RUNOFF(CFS) = 10.40
TOTAL AREA(ACRES) = 4.00 PEAK FLOW RATE(CFS) = 10.40

FLOW PROCESS FROM NODE 256.00 TO NODE 257.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>(STREET TABLE SECTION # 2 USED)<<<<

=====
UPSTREAM ELEVATION(FEET) = 48.00 DOWNSTREAM ELEVATION(FEET) = 47.00
STREET LENGTH(FEET) = 425.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 17.67
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.60

GC10

HALFSTREET FLOOD WIDTH(FEET) = 21.94
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.77
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.05
 STREET FLOW TRAVEL TIME(MIN.) = 4.01 Tc(MIN.) = 12.60
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.391
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	4.60	0.25	0.500	69
COMMERCIAL	C	2.40	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.363
 SUBAREA AREA(ACRES) = 7.00 SUBAREA RUNOFF(CFS) = 14.49
 EFFECTIVE AREA(ACRES) = 11.00 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.36
 TOTAL AREA(ACRES) = 11.0 PEAK FLOW RATE(CFS) = 22.77

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 24.24
 FLOW VELOCITY(FEET/SEC.) = 1.88 DEPTH*VELOCITY(FT*FT/SEC.) = 1.21
 LONGEST FLOWPATH FROM NODE 255.00 TO NODE 257.00 = 755.00 FEET.

FLOW PROCESS FROM NODE 257.00 TO NODE 258.00 IS CODE = 62

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 2 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 47.00 DOWNSTREAM ELEVATION(FEET) = 46.00
 STREET LENGTH(FEET) = 1528.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 34.01
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.87
 HALFSTREET FLOOD WIDTH(FEET) = 46.19
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.21
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.06
 STREET FLOW TRAVEL TIME(MIN.) = 21.10 Tc(MIN.) = 33.70
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.360

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	13.00	0.25	0.500	69
COMMERCIAL	C	6.40	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.368
 SUBAREA AREA(ACRES) = 19.40 SUBAREA RUNOFF(CFS) = 22.15
 EFFECTIVE AREA(ACRES) = 30.40 AREA-AVERAGED Fm(INCH/HR) = 0.09

GC10

AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.37
TOTAL AREA(ACRES) = 30.4 PEAK FLOW RATE(CFS) = 34.72

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.88 HALFSTREET FLOOD WIDTH(FEET) = 46.69
FLOW VELOCITY(FEET/SEC.) = 1.21 DEPTH*VELOCITY(FT*FT/SEC.) = 1.07
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 1528.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 26.7 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 258.00
LONGEST FLOWPATH FROM NODE 255.00 TO NODE 258.00 = 2283.00 FEET.

FLOW PROCESS FROM NODE 258.00 TO NODE 259.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<<

=====

UPSTREAM ELEVATION(FEET) = 46.00 DOWNSTREAM ELEVATION(FEET) = 44.00
STREET LENGTH(FEET) = 1287.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 43.95
STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.76
HALFSTREET FLOOD WIDTH(FEET) = 33.17
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.03
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.55
STREET FLOW TRAVEL TIME(MIN.) = 10.57 Tc(MIN.) = 44.27
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.164

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	14.20	0.25	0.500	69
COMMERCIAL	C	4.80	0.25	0.100	69
URBAN POOR COVER					
"TURF"	C	0.30	0.25	1.000	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.408
SUBAREA AREA(ACRES) = 19.30 SUBAREA RUNOFF(CFS) = 18.44
EFFECTIVE AREA(ACRES) = 49.70 AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.38
TOTAL AREA(ACRES) = 49.7 PEAK FLOW RATE(CFS) = 47.77

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.79 HALFSTREET FLOOD WIDTH(FEET) = 34.27
FLOW VELOCITY(FEET/SEC.) = 2.06 DEPTH*VELOCITY(FT*FT/SEC.) = 1.62
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 1287.0 FT WITH ELEVATION-DROP = 2.0 FT, IS 30.6 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 259.00

GC10
LONGEST FLOWPATH FROM NODE 255.00 TO NODE 259.00 = 3570.00 FEET.

FLOW PROCESS FROM NODE 259.00 TO NODE 260.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 44.00 DOWNSTREAM(FEET) = 43.00
FLOW LENGTH(FEET) = 135.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 36.0 INCH PIPE IS 26.1 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 8.69
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 47.77
PIPE TRAVEL TIME(MIN.) = 0.26 Tc(MIN.) = 44.53
LONGEST FLOWPATH FROM NODE 255.00 TO NODE 260.00 = 3705.00 FEET.

-----+-----
| END OF SYSTEM |
-----+-----

FLOW PROCESS FROM NODE 261.00 TO NODE 262.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 56.00 DOWNSTREAM(FEET) = 54.00

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.586

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	1.70	0.25	0.500	69	10.99
COMMERCIAL	C	3.00	0.25	0.100	69	8.59
SCHOOL	C	1.10	0.25	0.600	69	11.64

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.312

SUBAREA RUNOFF(CFS) = 15.14

TOTAL AREA(ACRES) = 5.80 PEAK FLOW RATE(CFS) = 15.14

FLOW PROCESS FROM NODE 262.00 TO NODE 263.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 54.00 DOWNSTREAM ELEVATION(FEET) = 52.00
STREET LENGTH(FEET) = 704.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

GC10

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 26.02

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.59

HALFSTREET FLOOD WIDTH(FEET) = 24.75

AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.19

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.30

STREET FLOW TRAVEL TIME(MIN.) = 5.37 Tc(MIN.) = 13.95

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.255

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	4.30	0.25	0.500	69
COMMERCIAL	C	2.30	0.25	0.100	69
URBAN POOR COVER					
"TURF"	C	0.20	0.25	1.000	83
SCHOOL	C	4.40	0.25	0.600	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.466

SUBAREA AREA(ACRES) = 11.20 SUBAREA RUNOFF(CFS) = 21.55

EFFECTIVE AREA(ACRES) = 17.00 AREA-AVERAGED Fm(INCH/HR) = 0.10

AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.41

TOTAL AREA(ACRES) = 17.0 PEAK FLOW RATE(CFS) = 32.92

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 26.82

FLOW VELOCITY(FEET/SEC.) = 2.35 DEPTH*VELOCITY(FT*FT/SEC.) = 1.49

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 704.0 FT WITH ELEVATION-DROP = 2.0 FT, IS 22.0 CFS,

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 263.00

LONGEST FLOWPATH FROM NODE 261.00 TO NODE 263.00 = 1034.00 FEET.

FLOW PROCESS FROM NODE 263.00 TO NODE 264.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 52.00 DOWNSTREAM ELEVATION(FEET) = 48.00

STREET LENGTH(FEET) = 2045.00 CURB HEIGHT(INCHES) = 6.0

STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 46.44

STREET FLOWING FULL

GC10

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.75
 HALFSTREET FLOOD WIDTH(FEET) = 32.44
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.24
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.68
 STREET FLOW TRAVEL TIME(MIN.) = 15.19 Tc(MIN.) = 29.14
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.479

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	14.90	0.25	0.500	69
COMMERCIAL	C	5.80	0.25	0.100	69
URBAN POOR COVER					
"TURF"	C	0.90	0.25	1.000	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.413
 SUBAREA AREA(ACRES) = 21.60 SUBAREA RUNOFF(CFS) = 26.74
 EFFECTIVE AREA(ACRES) = 38.60 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.41
 TOTAL AREA(ACRES) = 38.6 PEAK FLOW RATE(CFS) = 47.78

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.76 HALFSTREET FLOOD WIDTH(FEET) = 32.81
 FLOW VELOCITY(FEET/SEC.) = 2.26 DEPTH*VELOCITY(FT*FT/SEC.) = 1.71
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 2045.0 FT WITH ELEVATION-DROP = 4.0 FT, IS 31.5 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 264.00
 LONGEST FLOWPATH FROM NODE 261.00 TO NODE 264.00 = 3079.00 FEET.

FLOW PROCESS FROM NODE 264.00 TO NODE 265.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 48.00 DOWNSTREAM(FEET) = 47.00
 FLOW LENGTH(FEET) = 200.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 39.0 INCH PIPE IS 27.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 7.51
 ESTIMATED PIPE DIAMETER(INCH) = 39.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 47.78
 PIPE TRAVEL TIME(MIN.) = 0.44 Tc(MIN.) = 29.58
 LONGEST FLOWPATH FROM NODE 261.00 TO NODE 265.00 = 3279.00 FEET.

+-----+
 | END OF SYSTEM |
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FLOW PROCESS FROM NODE 266.00 TO NODE 267.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 50.00 DOWNSTREAM(FEET) = 49.00

GC10

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.862
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	5.30	0.25	0.500	69	12.62
COMMERCIAL	C	1.90	0.25	0.100	69	9.86
URBAN POOR COVER						
"TURF"	C	0.40	0.25	1.000	83	17.03

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.426
 SUBAREA RUNOFF(CFS) = 18.09
 TOTAL AREA(ACRES) = 7.60 PEAK FLOW RATE(CFS) = 18.09

 FLOW PROCESS FROM NODE 267.00 TO NODE 268.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<<

=====

UPSTREAM ELEVATION(FEET) = 49.00 DOWNSTREAM ELEVATION(FEET) = 48.00
 STREET LENGTH(FEET) = 513.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 29.56
 STREET FLOWING FULL
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.65
 HALFSTREET FLOOD WIDTH(FEET) = 27.62
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.98
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.29
 STREET FLOW TRAVEL TIME(MIN.) = 4.31 Tc(MIN.) = 14.17
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.235

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	7.60	0.25	0.500	69
COMMERCIAL	C	3.60	0.25	0.100	69
URBAN POOR COVER					
"TURF"	C	0.70	0.25	1.000	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.408
 SUBAREA AREA(ACRES) = 11.90 SUBAREA RUNOFF(CFS) = 22.84
 EFFECTIVE AREA(ACRES) = 19.50 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.42
 TOTAL AREA(ACRES) = 19.5 PEAK FLOW RATE(CFS) = 37.39

END OF SUBAREA STREET FLOW HYDRAULICS:

GC10

DEPTH(FEET) = 0.70 HALFSTREET FLOOD WIDTH(FEET) = 30.00
FLOW VELOCITY(FEET/SEC.) = 2.12 DEPTH*VELOCITY(FT*FT/SEC.) = 1.48
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 513.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 24.2 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 268.00
LONGEST FLOWPATH FROM NODE 266.00 TO NODE 268.00 = 843.00 FEET.

FLOW PROCESS FROM NODE 268.00 TO NODE 269.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 48.00 DOWNSTREAM ELEVATION(FEET) = 47.00
STREET LENGTH(FEET) = 809.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 50.04
STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.83
HALFSTREET FLOOD WIDTH(FEET) = 36.41
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.91
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.58
STREET FLOW TRAVEL TIME(MIN.) = 7.05 Tc(MIN.) = 21.22
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.773

SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Rows include RESIDENTIAL, COMMERCIAL, and URBAN POOR COVER.

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.382
SUBAREA AREA(ACRES) = 16.70 SUBAREA RUNOFF(CFS) = 25.22
EFFECTIVE AREA(ACRES) = 36.20 AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.40
TOTAL AREA(ACRES) = 36.2 PEAK FLOW RATE(CFS) = 54.51

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.85 HALFSTREET FLOOD WIDTH(FEET) = 37.57
FLOW VELOCITY(FEET/SEC.) = 1.96 DEPTH*VELOCITY(FT*FT/SEC.) = 1.67
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 809.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 28.9 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 269.00
LONGEST FLOWPATH FROM NODE 266.00 TO NODE 269.00 = 1652.00 FEET.

FLOW PROCESS FROM NODE 269.00 TO NODE 270.00 IS CODE = 62

GC10

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 47.00 DOWNSTREAM ELEVATION(FEET) = 46.00
 STREET LENGTH(FEET) = 1458.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 69.65
 STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 1.03
 HALFSTREET FLOOD WIDTH(FEET) = 46.29
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.64
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.68
 STREET FLOW TRAVEL TIME(MIN.) = 14.83 Tc(MIN.) = 36.05
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.309

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	11.00	0.25	0.500	69
COMMERCIAL	C	15.30	0.25	0.100	69
URBAN POOR COVER					
"TURF"	C	0.80	0.25	1.000	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.289
 SUBAREA AREA(ACRES) = 27.10 SUBAREA RUNOFF(CFS) = 30.16
 EFFECTIVE AREA(ACRES) = 63.30 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.35
 TOTAL AREA(ACRES) = 63.3 PEAK FLOW RATE(CFS) = 69.54

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 1.03 HALFSTREET FLOOD WIDTH(FEET) = 46.29
 FLOW VELOCITY(FEET/SEC.) = 1.64 DEPTH*VELOCITY(FT*FT/SEC.) = 1.68
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 1458.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 38.5 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 270.00
 LONGEST FLOWPATH FROM NODE 266.00 TO NODE 270.00 = 3110.00 FEET.

 FLOW PROCESS FROM NODE 270.00 TO NODE 271.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 46.00 DOWNSTREAM(FEET) = 45.00
 FLOW LENGTH(FEET) = 218.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 33.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 7.96
 ESTIMATED PIPE DIAMETER(INCH) = 45.00 NUMBER OF PIPES = 1

GC10

PIPE-FLOW(CFS) = 69.54
PIPE TRAVEL TIME(MIN.) = 0.46 Tc(MIN.) = 36.51
LONGEST FLOWPATH FROM NODE 266.00 TO NODE 271.00 = 3328.00 FEET.

END OF SYSTEM

FLOW PROCESS FROM NODE 272.00 TO NODE 273.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 45.00 DOWNSTREAM(FEET) = 44.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.862
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	4.00	0.25	0.500	69	12.62
COMMERCIAL	C	1.80	0.25	0.100	69	9.86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.376

SUBAREA RUNOFF(CFS) = 13.87

TOTAL AREA(ACRES) = 5.80 PEAK FLOW RATE(CFS) = 13.87

FLOW PROCESS FROM NODE 273.00 TO NODE 274.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 44.00 DOWNSTREAM ELEVATION(FEET) = 42.00
STREET LENGTH(FEET) = 863.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 21.03

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.58

HALFSTREET FLOOD WIDTH(FEET) = 23.83

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.91

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.10

STREET FLOW TRAVEL TIME(MIN.) = 7.53 Tc(MIN.) = 17.39

GC10

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.987

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	3.20	0.25	0.500	69
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	2.80	0.20	0.500	75
COMMERCIAL	C	0.80	0.25	0.100	69
COMMERCIAL	D	1.50	0.20	0.100	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.389

SUBAREA AREA(ACRES) = 8.30 SUBAREA RUNOFF(CFS) = 14.19

EFFECTIVE AREA(ACRES) = 14.10 AREA-AVERAGED Fm(INCH/HR) = 0.09

AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.38

TOTAL AREA(ACRES) = 14.1 PEAK FLOW RATE(CFS) = 24.07

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.60 HALFSTREET FLOOD WIDTH(FEET) = 24.93

FLOW VELOCITY(FEET/SEC.) = 1.99 DEPTH*VELOCITY(FT*FT/SEC.) = 1.19

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 863.0 FT WITH ELEVATION-DROP = 2.0 FT, IS 15.3 CFS,

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 274.00

LONGEST FLOWPATH FROM NODE 272.00 TO NODE 274.00 = 1193.00 FEET.

FLOW PROCESS FROM NODE 274.00 TO NODE 278.00 IS CODE = 31

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

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 42.00 DOWNSTREAM(FEET) = 40.00

FLOW LENGTH(FEET) = 494.00 MANNING'S N = 0.013

DEPTH OF FLOW IN 30.0 INCH PIPE IS 23.9 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 5.75

ESTIMATED PIPE DIAMETER(INCH) = 30.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) = 24.07

PIPE TRAVEL TIME(MIN.) = 1.43 Tc(MIN.) = 18.82

LONGEST FLOWPATH FROM NODE 272.00 TO NODE 278.00 = 1687.00 FEET.

FLOW PROCESS FROM NODE 278.00 TO NODE 278.00 IS CODE = 1

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

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 18.82

RAINFALL INTENSITY(INCH/HR) = 1.90

AREA-AVERAGED Fm(INCH/HR) = 0.09

AREA-AVERAGED Fp(INCH/HR) = 0.24

AREA-AVERAGED Ap = 0.38

EFFECTIVE STREAM AREA(ACRES) = 14.10

TOTAL STREAM AREA(ACRES) = 14.10

PEAK FLOW RATE(CFS) AT CONFLUENCE = 24.07

FLOW PROCESS FROM NODE 275.00 TO NODE 276.00 IS CODE = 21

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

GC10

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 46.00 DOWNSTREAM(FEET) = 44.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.586
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	1.20	0.25	0.500	69	10.99
COMMERCIAL	C	0.30	0.25	0.100	69	8.59
URBAN POOR COVER						
"TURF"	C	0.20	0.25	1.000	83	14.83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.488

SUBAREA RUNOFF(CFS) = 4.37

TOTAL AREA(ACRES) = 1.70 PEAK FLOW RATE(CFS) = 4.37

FLOW PROCESS FROM NODE 276.00 TO NODE 277.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 44.00 DOWNSTREAM ELEVATION(FEET) = 42.00
 STREET LENGTH(FEET) = 453.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.43

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.39

HALFSTREET FLOOD WIDTH(FEET) = 13.79

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.81

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.71

STREET FLOW TRAVEL TIME(MIN.) = 4.16 Tc(MIN.) = 12.75

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.374

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	2.00	0.25	0.500	69
COMMERCIAL	C	0.70	0.25	0.100	69
URBAN POOR COVER					
"TURF"	C	0.30	0.25	1.000	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.457

SUBAREA AREA(ACRES) = 3.00 SUBAREA RUNOFF(CFS) = 6.10

EFFECTIVE AREA(ACRES) = 4.70 AREA-AVERAGED Fm(INCH/HR) = 0.12

GC10

AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.47
TOTAL AREA(ACRES) = 4.7 PEAK FLOW RATE(CFS) = 9.55

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.42 HALFSTREET FLOOD WIDTH(FEET) = 15.27
FLOW VELOCITY(FEET/SEC.) = 1.92 DEPTH*VELOCITY(FT*FT/SEC.) = 0.81
LONGEST FLOWPATH FROM NODE 275.00 TO NODE 277.00 = 783.00 FEET.

FLOW PROCESS FROM NODE 277.00 TO NODE 278.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<<

UPSTREAM ELEVATION(FEET) = 42.00 DOWNSTREAM ELEVATION(FEET) = 40.00
STREET LENGTH(FEET) = 735.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 17.62

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.54
HALFSTREET FLOOD WIDTH(FEET) = 21.94
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.90
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.02
STREET FLOW TRAVEL TIME(MIN.) = 6.45 Tc(MIN.) = 19.20
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.878

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	2.30	0.25	0.500	69
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	5.50	0.20	0.500	75
COMMERCIAL	C	0.90	0.25	0.100	69
COMMERCIAL	D	0.80	0.20	0.100	75
URBAN POOR COVER					
"TURF"	C	0.30	0.25	1.000	83
URBAN POOR COVER					
"TURF"	D	0.20	0.20	1.000	87

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.457
SUBAREA AREA(ACRES) = 10.00 SUBAREA RUNOFF(CFS) = 16.01
EFFECTIVE AREA(ACRES) = 14.70 AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 0.46
TOTAL AREA(ACRES) = 14.7 PEAK FLOW RATE(CFS) = 23.46

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 24.08
FLOW VELOCITY(FEET/SEC.) = 2.09 DEPTH*VELOCITY(FT*FT/SEC.) = 1.21
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

GC10

AND L = 735.0 FT WITH ELEVATION-DROP = 2.0 FT, IS 19.5 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 278.00
LONGEST FLOWPATH FROM NODE 275.00 TO NODE 278.00 = 1518.00 FEET.

FLOW PROCESS FROM NODE 278.00 TO NODE 278.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 19.20
RAINFALL INTENSITY(INCH/HR) = 1.88
AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.23
AREA-AVERAGED Ap = 0.46
EFFECTIVE STREAM AREA(ACRES) = 14.70
TOTAL STREAM AREA(ACRES) = 14.70
PEAK FLOW RATE(CFS) AT CONFLUENCE = 23.46

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24.07	18.82	1.899	0.24(0.09)	0.38	14.1	272.00
2	23.46	19.20	1.878	0.23(0.10)	0.46	14.7	275.00

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	47.35	18.82	1.899	0.23(0.10)	0.42	28.5	272.00
2	47.25	19.20	1.878	0.23(0.10)	0.42	28.8	275.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 47.35 Tc(MIN.) = 18.82
EFFECTIVE AREA(ACRES) = 28.51 AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 0.42
TOTAL AREA(ACRES) = 28.8
LONGEST FLOWPATH FROM NODE 272.00 TO NODE 278.00 = 1687.00 FEET.

FLOW PROCESS FROM NODE 278.00 TO NODE 279.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 40.00 DOWNSTREAM(FEET) = 39.00
FLOW LENGTH(FEET) = 156.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 36.0 INCH PIPE IS 27.6 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 8.14
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 47.35
PIPE TRAVEL TIME(MIN.) = 0.32 Tc(MIN.) = 19.14
LONGEST FLOWPATH FROM NODE 272.00 TO NODE 279.00 = 1843.00 FEET.

+-----+
| END OF SYSTEM |

 FLOW PROCESS FROM NODE 280.00 TO NODE 281.00 IS CODE = 21

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 40.00 DOWNSTREAM(FEET) = 39.50

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 11.329

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.541

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.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	0.30	0.25	0.500	69	14.50
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	D	0.40	0.20	0.500	75	14.50
COMMERCIAL	C	0.10	0.25	0.100	69	11.33
COMMERCIAL	D	0.40	0.20	0.100	75	11.33
URBAN POOR COVER						
"TURF"	C	0.10	0.25	1.000	83	19.56
URBAN POOR COVER						
"TURF"	D	4.50	0.20	1.000	87	19.56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.862

SUBAREA RUNOFF(CFS) = 12.35

TOTAL AREA(ACRES) = 5.80 PEAK FLOW RATE(CFS) = 12.35

 FLOW PROCESS FROM NODE 281.00 TO NODE 282.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<
 =====

UPSTREAM ELEVATION(FEET) = 39.50 DOWNSTREAM ELEVATION(FEET) = 36.00
 STREET LENGTH(FEET) = 640.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 17.07

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.49

HALFSTREET FLOOD WIDTH(FEET) = 18.48

AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.40

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.16

STREET FLOW TRAVEL TIME(MIN.) = 4.45 T_c (MIN.) = 15.78

GC10

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.101

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	1.00	0.20	0.500	75
COMMERCIAL	D	0.50	0.20	0.100	75
URBAN POOR COVER					
"TURF"	D	3.90	0.20	1.000	87

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.824

SUBAREA AREA(ACRES) = 5.40 SUBAREA RUNOFF(CFS) = 9.41

EFFECTIVE AREA(ACRES) = 11.20 AREA-AVERAGED Fm(INCH/HR) = 0.17

AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.84

TOTAL AREA(ACRES) = 11.2 PEAK FLOW RATE(CFS) = 19.47

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.50 HALFSTREET FLOOD WIDTH(FEET) = 19.64

FLOW VELOCITY(FEET/SEC.) = 2.48 DEPTH*VELOCITY(FT*FT/SEC.) = 1.25

LONGEST FLOWPATH FROM NODE 280.00 TO NODE 282.00 = 970.00 FEET.

FLOW PROCESS FROM NODE 282.00 TO NODE 283.00 IS CODE = 31

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

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 36.00 DOWNSTREAM(FEET) = 35.00

FLOW LENGTH(FEET) = 470.00 MANNING'S N = 0.013

DEPTH OF FLOW IN 33.0 INCH PIPE IS 23.2 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 4.37

ESTIMATED PIPE DIAMETER(INCH) = 33.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) = 19.47

PIPE TRAVEL TIME(MIN.) = 1.79 Tc(MIN.) = 17.57

LONGEST FLOWPATH FROM NODE 280.00 TO NODE 283.00 = 1440.00 FEET.

FLOW PROCESS FROM NODE 283.00 TO NODE 283.00 IS CODE = 81

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

MAINLINE Tc(MIN.) = 17.57

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.976

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	1.10	0.20	0.500	75
COMMERCIAL	D	0.60	0.20	0.100	75
URBAN POOR COVER					
"TURF"	D	5.60	0.20	1.000	87

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.851

SUBAREA AREA(ACRES) = 7.30 SUBAREA RUNOFF(CFS) = 11.86

EFFECTIVE AREA(ACRES) = 18.50 AREA-AVERAGED Fm(INCH/HR) = 0.17

AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.85

TOTAL AREA(ACRES) = 18.5 PEAK FLOW RATE(CFS) = 30.06

+-----+
| END OF SYSTEM |

 FLOW PROCESS FROM NODE 284.00 TO NODE 285.00 IS CODE = 21

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 34.00 DOWNSTREAM(FEET) = 32.00

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 14.827

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.178

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.)
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URBAN POOR COVER

"TURF"	D	8.10	0.20	1.000	87	14.83
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SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

SUBAREA RUNOFF(CFS) = 14.42

TOTAL AREA(ACRES) = 8.10 PEAK FLOW RATE(CFS) = 14.42

 FLOW PROCESS FROM NODE 285.00 TO NODE 286.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<
 =====

UPSTREAM ELEVATION(FEET) = 32.00 DOWNSTREAM ELEVATION(FEET) = 31.50
 STREET LENGTH(FEET) = 163.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.58

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.55

HALFSTREET FLOOD WIDTH(FEET) = 22.61

AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.08

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.15

STREET FLOW TRAVEL TIME(MIN.) = 1.30 T_c (MIN.) = 16.13

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.075

SUBAREA LOSS RATE DATA(AMC II):

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

"TURF"	D	7.20	0.20	1.000	87
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SCHOOL	D	0.10	0.20	0.600	75
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GC10

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.995
SUBAREA AREA(ACRES) = 7.30 SUBAREA RUNOFF(CFS) = 12.33
EFFECTIVE AREA(ACRES) = 15.40 AREA-AVERAGED Fm(INCH/HR) = 0.20
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 15.4 PEAK FLOW RATE(CFS) = 25.99

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 24.44
FLOW VELOCITY(FEET/SEC.) = 2.24 DEPTH*VELOCITY(FT*FT/SEC.) = 1.32
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 163.0 FT WITH ELEVATION-DROP = 0.5 FT, IS 16.6 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 286.00
LONGEST FLOWPATH FROM NODE 284.00 TO NODE 286.00 = 493.00 FEET.

FLOW PROCESS FROM NODE 286.00 TO NODE 287.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 31.50 DOWNSTREAM(FEET) = 31.00
FLOW LENGTH(FEET) = 888.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 45.0 INCH PIPE IS 35.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 2.81
ESTIMATED PIPE DIAMETER(INCH) = 45.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 25.99
PIPE TRAVEL TIME(MIN.) = 5.27 Tc(MIN.) = 21.40
LONGEST FLOWPATH FROM NODE 284.00 TO NODE 287.00 = 1381.00 FEET.

FLOW PROCESS FROM NODE 287.00 TO NODE 287.00 IS CODE = 81

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

MAINLINE Tc(MIN.) = 21.40
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.764
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
URBAN POOR COVER
"TURF" D 12.80 0.20 1.000 87
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA AREA(ACRES) = 12.80 SUBAREA RUNOFF(CFS) = 18.02
EFFECTIVE AREA(ACRES) = 28.20 AREA-AVERAGED Fm(INCH/HR) = 0.20
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 28.2 PEAK FLOW RATE(CFS) = 39.71

END OF SYSTEM

FLOW PROCESS FROM NODE 288.00 TO NODE 289.00 IS CODE = 21

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

GC10

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INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 44.00 DOWNSTREAM(FEET) = 43.50

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.329
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.541

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	1.70	0.25	0.500	69	14.50
COMMERCIAL	C	0.50	0.25	0.100	69	11.33

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.409

SUBAREA RUNOFF(CFS) = 4.83

TOTAL AREA(ACRES) = 2.20 PEAK FLOW RATE(CFS) = 4.83

FLOW PROCESS FROM NODE 289.00 TO NODE 290.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 43.50 DOWNSTREAM ELEVATION(FEET) = 43.00

STREET LENGTH(FEET) = 456.00 CURB HEIGHT(INCHES) = 6.0

STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.30

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.48

HALFSTREET FLOOD WIDTH(FEET) = 18.16

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.06

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.51

STREET FLOW TRAVEL TIME(MIN.) = 7.17 Tc(MIN.) = 18.50

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.918

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	2.10	0.25	0.500	69
COMMERCIAL	C	0.90	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.380

SUBAREA AREA(ACRES) = 3.00 SUBAREA RUNOFF(CFS) = 4.92

EFFECTIVE AREA(ACRES) = 5.20 AREA-AVERAGED Fm(INCH/HR) = 0.10

AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.39

TOTAL AREA(ACRES) = 5.2 PEAK FLOW RATE(CFS) = 8.52

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.50 HALFSTREET FLOOD WIDTH(FEET) = 19.33

GC10

FLOW VELOCITY(FEET/SEC.) = 1.10 DEPTH*VELOCITY(FT*FT/SEC.) = 0.55
LONGEST FLOWPATH FROM NODE 288.00 TO NODE 290.00 = 786.00 FEET.

FLOW PROCESS FROM NODE 290.00 TO NODE 291.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<<

=====

UPSTREAM ELEVATION(FEET) = 43.00 DOWNSTREAM ELEVATION(FEET) = 41.00
STREET LENGTH(FEET) = 995.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.88
STREET FLOWING FULL
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.52
HALFSTREET FLOOD WIDTH(FEET) = 20.90
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.54
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.80
STREET FLOW TRAVEL TIME(MIN.) = 10.80 Tc(MIN.) = 29.30
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.474

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	5.30	0.25	0.500	69
COMMERCIAL	C	1.70	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.403
SUBAREA AREA(ACRES) = 7.00 SUBAREA RUNOFF(CFS) = 8.65
EFFECTIVE AREA(ACRES) = 12.20 AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.40
TOTAL AREA(ACRES) = 12.2 PEAK FLOW RATE(CFS) = 15.09

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.54 HALFSTREET FLOOD WIDTH(FEET) = 21.94
FLOW VELOCITY(FEET/SEC.) = 1.63 DEPTH*VELOCITY(FT*FT/SEC.) = 0.88
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 995.0 FT WITH ELEVATION-DROP = 2.0 FT, IS 12.2 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 291.00
LONGEST FLOWPATH FROM NODE 288.00 TO NODE 291.00 = 1781.00 FEET.

FLOW PROCESS FROM NODE 291.00 TO NODE 292.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<<

=====

UPSTREAM ELEVATION(FEET) = 41.00 DOWNSTREAM ELEVATION(FEET) = 38.00
STREET LENGTH(FEET) = 2113.00 CURB HEIGHT(INCHES) = 6.0

GC10

STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 26.34

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.66

HALFSTREET FLOOD WIDTH(FEET) = 28.05

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.71

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.13

STREET FLOW TRAVEL TIME(MIN.) = 20.55 Tc(MIN.) = 49.85

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.087

SUBAREA LOSS RATE DATA(AMC II):

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

"5-7 DWELLINGS/ACRE" C 18.20 0.25 0.500 69

COMMERCIAL C 6.80 0.25 0.100 69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.391

SUBAREA AREA(ACRES) = 25.00 SUBAREA RUNOFF(CFS) = 22.26

EFFECTIVE AREA(ACRES) = 37.20 AREA-AVERAGED Fm(INCH/HR) = 0.10

AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.39

TOTAL AREA(ACRES) = 37.2 PEAK FLOW RATE(CFS) = 33.10

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.71 HALFSTREET FLOOD WIDTH(FEET) = 30.43

FLOW VELOCITY(FEET/SEC.) = 1.82 DEPTH*VELOCITY(FT*FT/SEC.) = 1.29

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 2113.0 FT WITH ELEVATION-DROP = 3.0 FT, IS 34.9 CFS,

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 292.00

LONGEST FLOWPATH FROM NODE 288.00 TO NODE 292.00 = 3894.00 FEET.

FLOW PROCESS FROM NODE 292.00 TO NODE 293.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 38.00 DOWNSTREAM ELEVATION(FEET) = 37.00

STREET LENGTH(FEET) = 307.00 CURB HEIGHT(INCHES) = 6.0

STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

GC10

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 48.55

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.70

HALFSTREET FLOOD WIDTH(FEET) = 30.06

AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.74

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.92

STREET FLOW TRAVEL TIME(MIN.) = 1.87 Tc(MIN.) = 51.72

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.064

SUBAREA LOSS RATE DATA(AMC II):

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

"5-7 DWELLINGS/ACRE" C 26.60 0.25 0.500 69

COMMERCIAL C 9.00 0.25 0.100 69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.399

SUBAREA AREA(ACRES) = 35.60 SUBAREA RUNOFF(CFS) = 30.90

EFFECTIVE AREA(ACRES) = 72.80 AREA-AVERAGED Fm(INCH/HR) = 0.10

AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.40

TOTAL AREA(ACRES) = 72.8 PEAK FLOW RATE(CFS) = 63.24

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.76 HALFSTREET FLOOD WIDTH(FEET) = 33.11

FLOW VELOCITY(FEET/SEC.) = 2.93 DEPTH*VELOCITY(FT*FT/SEC.) = 2.23

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 307.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 87.2 CFS,

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 293.00

LONGEST FLOWPATH FROM NODE 288.00 TO NODE 293.00 = 4201.00 FEET.

FLOW PROCESS FROM NODE 293.00 TO NODE 298.00 IS CODE = 31

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

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 37.00 DOWNSTREAM(FEET) = 36.00

FLOW LENGTH(FEET) = 922.00 MANNING'S N = 0.013

DEPTH OF FLOW IN 57.0 INCH PIPE IS 41.9 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 4.53

ESTIMATED PIPE DIAMETER(INCH) = 57.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) = 63.24

PIPE TRAVEL TIME(MIN.) = 3.40 Tc(MIN.) = 55.12

LONGEST FLOWPATH FROM NODE 288.00 TO NODE 298.00 = 5123.00 FEET.

FLOW PROCESS FROM NODE 298.00 TO NODE 298.00 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.) = 55.12

RAINFALL INTENSITY(INCH/HR) = 1.03

AREA-AVERAGED Fm(INCH/HR) = 0.10

AREA-AVERAGED Fp(INCH/HR) = 0.25

AREA-AVERAGED Ap = 0.40

EFFECTIVE STREAM AREA(ACRES) = 72.80

TOTAL STREAM AREA(ACRES) = 72.80

PEAK FLOW RATE(CFS) AT CONFLUENCE = 63.24

GC10

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

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 40.00 DOWNSTREAM(FEET) = 39.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.862
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	4.40	0.25	0.500	69	12.62
COMMERCIAL	C	1.40	0.25	0.100	69	9.86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.403

SUBAREA RUNOFF(CFS) = 13.83

TOTAL AREA(ACRES) = 5.80 PEAK FLOW RATE(CFS) = 13.83

FLOW PROCESS FROM NODE 295.00 TO NODE 296.00 IS CODE = 62

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 39.00 DOWNSTREAM ELEVATION(FEET) = 38.00
 STREET LENGTH(FEET) = 536.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 21.92

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.60

HALFSTREET FLOOD WIDTH(FEET) = 25.05

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.80

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.08

STREET FLOW TRAVEL TIME(MIN.) = 4.97 Tc(MIN.) = 14.83

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.177

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	6.30	0.25	0.500	69
COMMERCIAL	C	2.30	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.393

GC10

SUBAREA AREA(ACRES) = 8.60 SUBAREA RUNOFF(CFS) = 16.09
 EFFECTIVE AREA(ACRES) = 14.40 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.40
 TOTAL AREA(ACRES) = 14.4 PEAK FLOW RATE(CFS) = 26.93

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 26.89
 FLOW VELOCITY(FEET/SEC.) = 1.91 DEPTH*VELOCITY(FT*FT/SEC.) = 1.22
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 536.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 17.3 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 296.00
 LONGEST FLOWPATH FROM NODE 294.00 TO NODE 296.00 = 866.00 FEET.

FLOW PROCESS FROM NODE 296.00 TO NODE 297.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 38.00 DOWNSTREAM ELEVATION(FEET) = 36.50
 STREET LENGTH(FEET) = 1133.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 43.14
 STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.78
 HALFSTREET FLOOD WIDTH(FEET) = 33.97
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.90
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.48
 STREET FLOW TRAVEL TIME(MIN.) = 9.94 Tc(MIN.) = 24.78
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.622

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	16.90	0.25	0.500	69
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	0.90	0.20	0.500	75
COMMERCIAL	C	5.60	0.25	0.100	69
COMMERCIAL	D	0.10	0.20	0.100	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.403
 SUBAREA AREA(ACRES) = 23.50 SUBAREA RUNOFF(CFS) = 32.21
 EFFECTIVE AREA(ACRES) = 37.90 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.40
 TOTAL AREA(ACRES) = 37.9 PEAK FLOW RATE(CFS) = 51.95

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.83 HALFSTREET FLOOD WIDTH(FEET) = 36.41
 FLOW VELOCITY(FEET/SEC.) = 1.99 DEPTH*VELOCITY(FT*FT/SEC.) = 1.64

GC10

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 1133.0 FT WITH ELEVATION-DROP = 1.5 FT, IS 37.8 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 297.00
 LONGEST FLOWPATH FROM NODE 294.00 TO NODE 297.00 = 1999.00 FEET.

 FLOW PROCESS FROM NODE 297.00 TO NODE 298.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 36.50 DOWNSTREAM(FEET) = 36.00
 FLOW LENGTH(FEET) = 120.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 42.0 INCH PIPE IS 29.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 7.18
 ESTIMATED PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 51.95
 PIPE TRAVEL TIME(MIN.) = 0.28 Tc(MIN.) = 25.06
 LONGEST FLOWPATH FROM NODE 294.00 TO NODE 298.00 = 2119.00 FEET.

 FLOW PROCESS FROM NODE 298.00 TO NODE 298.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 25.06
 RAINFALL INTENSITY(INCH/HR) = 1.61
 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.40
 EFFECTIVE STREAM AREA(ACRES) = 37.90
 TOTAL STREAM AREA(ACRES) = 37.90
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 51.95

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	63.24	55.12	1.026	0.25(0.10)	0.40	72.8	288.00
2	51.95	25.06	1.612	0.25(0.10)	0.40	37.9	294.00

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	98.87	25.06	1.612	0.25(0.10)	0.40	71.0	294.00
2	95.06	55.12	1.026	0.25(0.10)	0.40	110.7	288.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 98.87 Tc(MIN.) = 25.06
 EFFECTIVE AREA(ACRES) = 71.00 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.40
 TOTAL AREA(ACRES) = 110.7
 LONGEST FLOWPATH FROM NODE 288.00 TO NODE 298.00 = 5123.00 FEET.

GC10

FLOW PROCESS FROM NODE 298.00 TO NODE 303.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 36.00 DOWNSTREAM(FEET) = 35.50
FLOW LENGTH(FEET) = 745.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 72.0 INCH PIPE IS 56.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.19
ESTIMATED PIPE DIAMETER(INCH) = 72.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 98.87
PIPE TRAVEL TIME(MIN.) = 2.96 Tc(MIN.) = 28.02
LONGEST FLOWPATH FROM NODE 288.00 TO NODE 303.00 = 5868.00 FEET.

FLOW PROCESS FROM NODE 303.00 TO NODE 303.00 IS CODE = 1

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

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 28.02
RAINFALL INTENSITY(INCH/HR) = 1.51
AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.25
AREA-AVERAGED Ap = 0.40
EFFECTIVE STREAM AREA(ACRES) = 71.00
TOTAL STREAM AREA(ACRES) = 110.70
PEAK FLOW RATE(CFS) AT CONFLUENCE = 98.87

FLOW PROCESS FROM NODE 299.00 TO NODE 300.00 IS CODE = 21

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 45.00 DOWNSTREAM(FEET) = 44.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.862
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751

SUBAREA Tc AND LOSS RATE DATA(AMC II):

Table with 7 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN, Tc (MIN.). Rows include RESIDENTIAL and COMMERCIAL.

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.336
SUBAREA RUNOFF(CFS) = 14.64
TOTAL AREA(ACRES) = 6.10 PEAK FLOW RATE(CFS) = 14.64

FLOW PROCESS FROM NODE 300.00 TO NODE 301.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 44.00 DOWNSTREAM ELEVATION(FEET) = 42.00

GC10

STREET LENGTH(FEET) = 885.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 32.13
STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.65
HALFSTREET FLOOD WIDTH(FEET) = 27.68
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.15
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.40
STREET FLOW TRAVEL TIME(MIN.) = 6.87 Tc(MIN.) = 16.73
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.032

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	13.10	0.25	0.500	69
COMMERCIAL	C	6.70	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.365
SUBAREA AREA(ACRES) = 19.80 SUBAREA RUNOFF(CFS) = 34.58
EFFECTIVE AREA(ACRES) = 25.90 AREA-AVERAGED Fm(INCH/HR) = 0.09
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.36
TOTAL AREA(ACRES) = 25.9 PEAK FLOW RATE(CFS) = 45.27

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.73 HALFSTREET FLOOD WIDTH(FEET) = 31.34
FLOW VELOCITY(FEET/SEC.) = 2.35 DEPTH*VELOCITY(FT*FT/SEC.) = 1.71
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 885.0 FT WITH ELEVATION-DROP = 2.0 FT, IS 36.2 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 301.00
LONGEST FLOWPATH FROM NODE 299.00 TO NODE 301.00 = 1215.00 FEET.

FLOW PROCESS FROM NODE 301.00 TO NODE 302.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 42.00 DOWNSTREAM ELEVATION(FEET) = 37.00
STREET LENGTH(FEET) = 1530.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

GC10

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 68.65

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.78

HALFSTREET FLOOD WIDTH(FEET) = 34.15

AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.99

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.34

STREET FLOW TRAVEL TIME(MIN.) = 8.53 Tc(MIN.) = 25.26

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.605

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	8.30	0.25	0.500	69
COMMERCIAL	D	11.60	0.20	0.100	75
URBAN POOR COVER					
"TURF"	C	0.70	0.25	1.000	83
URBAN POOR COVER					
"TURF"	D	1.90	0.20	1.000	87
SCHOOL	C	7.20	0.25	0.600	69
SCHOOL	D	4.70	0.20	0.600	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.437

SUBAREA AREA(ACRES) = 34.40 SUBAREA RUNOFF(CFS) = 46.55

EFFECTIVE AREA(ACRES) = 60.30 AREA-AVERAGED Fm(INCH/HR) = 0.10

AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.40

TOTAL AREA(ACRES) = 60.3 PEAK FLOW RATE(CFS) = 81.87

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.83 HALFSTREET FLOOD WIDTH(FEET) = 36.47

FLOW VELOCITY(FEET/SEC.) = 3.12 DEPTH*VELOCITY(FT*FT/SEC.) = 2.59

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 1530.0 FT WITH ELEVATION-DROP = 5.0 FT, IS 57.3 CFS,

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 302.00

LONGEST FLOWPATH FROM NODE 299.00 TO NODE 302.00 = 2745.00 FEET.

FLOW PROCESS FROM NODE 302.00 TO NODE 303.00 IS CODE = 31

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

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 37.00 DOWNSTREAM(FEET) = 35.50

FLOW LENGTH(FEET) = 84.00 MANNING'S N = 0.013

DEPTH OF FLOW IN 36.0 INCH PIPE IS 28.5 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 13.63

ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) = 81.87

PIPE TRAVEL TIME(MIN.) = 0.10 Tc(MIN.) = 25.37

LONGEST FLOWPATH FROM NODE 299.00 TO NODE 303.00 = 2829.00 FEET.

FLOW PROCESS FROM NODE 303.00 TO NODE 303.00 IS CODE = 1

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

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

GC10

TIME OF CONCENTRATION(MIN.) = 25.37
 RAINFALL INTENSITY(INCH/HR) = 1.60
 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.24
 AREA-AVERAGED Ap = 0.40
 EFFECTIVE STREAM AREA(ACRES) = 60.30
 TOTAL STREAM AREA(ACRES) = 60.30
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 81.87

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	98.87	28.02	1.512	0.25(0.10)	0.40	71.0	294.00
1	95.06	58.09	0.996	0.25(0.10)	0.40	110.7	288.00
2	81.87	25.37	1.601	0.24(0.10)	0.40	60.3	299.00

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	176.99	25.37	1.601	0.24(0.10)	0.40	124.6	299.00
2	175.91	28.02	1.512	0.24(0.10)	0.40	131.3	294.00
3	144.02	58.09	0.996	0.25(0.10)	0.40	171.0	288.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 176.99 Tc(MIN.) = 25.37
 EFFECTIVE AREA(ACRES) = 124.57 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.40
 TOTAL AREA(ACRES) = 171.0
 LONGEST FLOWPATH FROM NODE 288.00 TO NODE 303.00 = 5868.00 FEET.

FLOW PROCESS FROM NODE 303.00 TO NODE 304.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 35.50 DOWNSTREAM(FEET) = 35.00
 FLOW LENGTH(FEET) = 1880.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 108.0 INCH PIPE IS 81.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 3.44
 ESTIMATED PIPE DIAMETER(INCH) = 108.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 176.99
 PIPE TRAVEL TIME(MIN.) = 9.10 Tc(MIN.) = 34.47
 LONGEST FLOWPATH FROM NODE 288.00 TO NODE 304.00 = 7748.00 FEET.

FLOW PROCESS FROM NODE 304.00 TO NODE 304.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN.) = 34.47
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.343
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL "5-7 DWELLINGS/ACRE"	C	0.40	0.25	0.500	69

GC10

RESIDENTIAL
 "5-7 DWELLINGS/ACRE" D 22.30 0.20 0.500 75
 COMMERCIAL C 0.10 0.25 0.100 69
 COMMERCIAL D 12.40 0.20 0.100 75
 URBAN POOR COVER
 "TURF" D 1.70 0.20 1.000 87
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.388
 SUBAREA AREA(ACRES) = 36.90 SUBAREA RUNOFF(CFS) = 42.02
 EFFECTIVE AREA(ACRES) = 161.47 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 0.40
 TOTAL AREA(ACRES) = 207.9 PEAK FLOW RATE(CFS) = 181.63

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| END OF SYSTEM |
+-----+
  
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 FLOW PROCESS FROM NODE 305.00 TO NODE 306.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 38.00 DOWNSTREAM(FEET) = 36.00

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$
 SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 8.586
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978
 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.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	D	1.20	0.20	0.500	75	10.99
COMMERCIAL	D	0.30	0.20	0.100	75	8.59
URBAN POOR COVER						
"TURF"	D	0.60	0.20	1.000	87	14.83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.586
 SUBAREA RUNOFF(CFS) = 5.41
 TOTAL AREA(ACRES) = 2.10 PEAK FLOW RATE(CFS) = 5.41

 FLOW PROCESS FROM NODE 306.00 TO NODE 307.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 36.00 DOWNSTREAM ELEVATION(FEET) = 34.00
 STREET LENGTH(FEET) = 826.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

GC10

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.04
STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.53
HALFSTREET FLOOD WIDTH(FEET) = 21.70
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.77
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.95

STREET FLOW TRAVEL TIME(MIN.) = 7.78 Tc(MIN.) = 16.36

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.058

SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Rows include RESIDENTIAL, '5-7 DWELLINGS/ACRE', COMMERCIAL, URBAN POOR COVER, and 'TURF'.

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.419
SUBAREA AREA(ACRES) = 11.70 SUBAREA RUNOFF(CFS) = 20.79
EFFECTIVE AREA(ACRES) = 13.80 AREA-AVERAGED Fm(INCH/HR) = 0.09
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.44
TOTAL AREA(ACRES) = 13.8 PEAK FLOW RATE(CFS) = 24.46

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.60 HALFSTREET FLOOD WIDTH(FEET) = 24.87
FLOW VELOCITY(FEET/SEC.) = 2.04 DEPTH*VELOCITY(FT*FT/SEC.) = 1.22
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 826.0 FT WITH ELEVATION-DROP = 2.0 FT, IS 22.0 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 307.00
LONGEST FLOWPATH FROM NODE 305.00 TO NODE 307.00 = 1156.00 FEET.

FLOW PROCESS FROM NODE 307.00 TO NODE 308.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 34.00 DOWNSTREAM ELEVATION(FEET) = 33.00
STREET LENGTH(FEET) = 405.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 32.22
STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.65
HALFSTREET FLOOD WIDTH(FEET) = 27.31
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.21

GC10

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.43
 STREET FLOW TRAVEL TIME(MIN.) = 3.05 Tc(MIN.) = 19.41
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.866
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	4.90	0.20	0.500	75
COMMERCIAL	D	4.20	0.20	0.100	75
URBAN POOR COVER					
"TURF"	D	0.50	0.20	1.000	87

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.351
 SUBAREA AREA(ACRES) = 9.60 SUBAREA RUNOFF(CFS) = 15.52
 EFFECTIVE AREA(ACRES) = 23.40 AREA-AVERAGED Fm(INCH/HR) = 0.08
 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.41
 TOTAL AREA(ACRES) = 23.4 PEAK FLOW RATE(CFS) = 37.59

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.68 HALFSTREET FLOOD WIDTH(FEET) = 28.84
 FLOW VELOCITY(FEET/SEC.) = 2.31 DEPTH*VELOCITY(FT*FT/SEC.) = 1.56
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 405.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 21.5 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 308.00
 LONGEST FLOWPATH FROM NODE 305.00 TO NODE 308.00 = 1561.00 FEET.

 FLOW PROCESS FROM NODE 308.00 TO NODE 309.00 IS CODE = 31

 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
 =====
 ELEVATION DATA: UPSTREAM(FEET) = 33.00 DOWNSTREAM(FEET) = 32.50
 FLOW LENGTH(FEET) = 449.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 36.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 3.95
 ESTIMATED PIPE DIAMETER(INCH) = 45.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 37.59
 PIPE TRAVEL TIME(MIN.) = 1.89 Tc(MIN.) = 21.31
 LONGEST FLOWPATH FROM NODE 305.00 TO NODE 309.00 = 2010.00 FEET.

 FLOW PROCESS FROM NODE 309.00 TO NODE 309.00 IS CODE = 81

 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
 =====
 MAINLINE Tc(MIN.) = 21.31
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.769
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	3.10	0.20	0.500	75
COMMERCIAL	D	1.20	0.20	0.100	75
URBAN POOR COVER					
"TURF"	D	7.60	0.20	1.000	87

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.779
 SUBAREA AREA(ACRES) = 11.90 SUBAREA RUNOFF(CFS) = 17.28
 EFFECTIVE AREA(ACRES) = 35.30 AREA-AVERAGED Fm(INCH/HR) = 0.11

GC10

AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.53
TOTAL AREA(ACRES) = 35.3 PEAK FLOW RATE(CFS) = 52.82

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+-----+
| END OF SYSTEM |
+-----+

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FLOW PROCESS FROM NODE 310.00 TO NODE 311.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 45.00 DOWNSTREAM(FEET) = 44.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.862
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	1.40	0.25	0.500	69	12.62
COMMERCIAL	C	0.70	0.25	0.100	69	9.86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.367
SUBAREA RUNOFF(CFS) = 5.03
TOTAL AREA(ACRES) = 2.10 PEAK FLOW RATE(CFS) = 5.03

FLOW PROCESS FROM NODE 311.00 TO NODE 312.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 44.00 DOWNSTREAM ELEVATION(FEET) = 42.00
STREET LENGTH(FEET) = 587.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.90
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.47
HALFSTREET FLOOD WIDTH(FEET) = 17.62
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.83
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.86
STREET FLOW TRAVEL TIME(MIN.) = 5.35 Tc(MIN.) = 15.21
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.146
SUBAREA LOSS RATE DATA(AMC II):

GC10

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	5.40	0.25	0.500	69
COMMERCIAL	C	2.00	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.392
 SUBAREA AREA(ACRES) = 7.40 SUBAREA RUNOFF(CFS) = 13.64
 EFFECTIVE AREA(ACRES) = 9.50 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.39
 TOTAL AREA(ACRES) = 9.5 PEAK FLOW RATE(CFS) = 17.52

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.52 HALFSTREET FLOOD WIDTH(FEET) = 21.21
 FLOW VELOCITY(FEET/SEC.) = 2.03 DEPTH*VELOCITY(FT*FT/SEC.) = 1.06
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 587.0 FT WITH ELEVATION-DROP = 2.0 FT, IS 15.6 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 312.00
 LONGEST FLOWPATH FROM NODE 310.00 TO NODE 312.00 = 917.00 FEET.

FLOW PROCESS FROM NODE 312.00 TO NODE 313.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 42.00 DOWNSTREAM ELEVATION(FEET) = 40.00
 STREET LENGTH(FEET) = 1008.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 28.35

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.64

HALFSTREET FLOOD WIDTH(FEET) = 27.13

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.97

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.27

STREET FLOW TRAVEL TIME(MIN.) = 8.51 Tc(MIN.) = 23.72

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.664

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	7.90	0.25	0.500	69
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	1.80	0.20	0.500	75
COMMERCIAL	C	2.30	0.25	0.100	69
COMMERCIAL	D	0.60	0.20	0.100	75
SCHOOL	D	2.70	0.20	0.600	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.442

GC10

SUBAREA AREA(ACRES) = 15.30 SUBAREA RUNOFF(CFS) = 21.50
 EFFECTIVE AREA(ACRES) = 24.80 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.42
 TOTAL AREA(ACRES) = 24.8 PEAK FLOW RATE(CFS) = 34.90

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.68 HALFSTREET FLOOD WIDTH(FEET) = 29.21
 FLOW VELOCITY(FEET/SEC.) = 2.09 DEPTH*VELOCITY(FT*FT/SEC.) = 1.43
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 1008.0 FT WITH ELEVATION-DROP = 2.0 FT, IS 26.5 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 313.00
 LONGEST FLOWPATH FROM NODE 310.00 TO NODE 313.00 = 1925.00 FEET.

FLOW PROCESS FROM NODE 313.00 TO NODE 314.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 40.00 DOWNSTREAM ELEVATION(FEET) = 38.00
 STREET LENGTH(FEET) = 265.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 46.87
 STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.61
 HALFSTREET FLOOD WIDTH(FEET) = 25.60
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.67
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.25
 STREET FLOW TRAVEL TIME(MIN.) = 1.20 Tc(MIN.) = 24.92
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.617

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	7.60	0.25	0.500	69
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	1.80	0.20	0.500	75
COMMERCIAL	D	3.80	0.20	0.100	75
URBAN POOR COVER					
"TURF"	D	1.70	0.20	1.000	87
SCHOOL	D	2.70	0.20	0.600	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.477
 SUBAREA AREA(ACRES) = 17.60 SUBAREA RUNOFF(CFS) = 23.93
 EFFECTIVE AREA(ACRES) = 42.40 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 0.44
 TOTAL AREA(ACRES) = 42.4 PEAK FLOW RATE(CFS) = 57.80

END OF SUBAREA STREET FLOW HYDRAULICS:

GC10

DEPTH(FEET) = 0.65 HALFSTREET FLOOD WIDTH(FEET) = 27.56
FLOW VELOCITY(FEET/SEC.) = 3.90 DEPTH*VELOCITY(FT*FT/SEC.) = 2.54
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 265.0 FT WITH ELEVATION-DROP = 2.0 FT, IS 49.2 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 314.00
LONGEST FLOWPATH FROM NODE 310.00 TO NODE 314.00 = 2190.00 FEET.

FLOW PROCESS FROM NODE 314.00 TO NODE 315.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 38.00 DOWNSTREAM(FEET) = 37.00
FLOW LENGTH(FEET) = 195.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 42.0 INCH PIPE IS 29.6 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 7.97
ESTIMATED PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 57.80
PIPE TRAVEL TIME(MIN.) = 0.41 Tc(MIN.) = 25.33
LONGEST FLOWPATH FROM NODE 310.00 TO NODE 315.00 = 2385.00 FEET.

END OF SYSTEM

FLOW PROCESS FROM NODE 316.00 TO NODE 317.00 IS CODE = 21

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 46.00 DOWNSTREAM(FEET) = 44.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.586
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978

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.)
RESIDENTIAL
"5-7 DWELLINGS/ACRE" C 3.10 0.25 0.500 69 10.99
COMMERCIAL C 6.20 0.25 0.100 69 8.59
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.233
SUBAREA RUNOFF(CFS) = 24.44
TOTAL AREA(ACRES) = 9.30 PEAK FLOW RATE(CFS) = 24.44

FLOW PROCESS FROM NODE 317.00 TO NODE 318.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 3 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 44.00 DOWNSTREAM ELEVATION(FEET) = 42.00
STREET LENGTH(FEET) = 913.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 51.00

GC10

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 25.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 44.52

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.79
HALFSTREET FLOOD WIDTH(FEET) = 38.01
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.09
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.66
STREET FLOW TRAVEL TIME(MIN.) = 7.28 Tc(MIN.) = 15.86
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.095

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	0.20	0.25	0.500	69
COMMERCIAL	C	21.20	0.25	0.100	69
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.104					
SUBAREA AREA(ACRES) = 21.40		SUBAREA RUNOFF(CFS) = 39.85			
EFFECTIVE AREA(ACRES) = 30.70		AREA-AVERAGED Fm(INCH/HR) = 0.04			
AREA-AVERAGED Fp(INCH/HR) = 0.25		AREA-AVERAGED Ap = 0.14			
TOTAL AREA(ACRES) = 30.7		PEAK FLOW RATE(CFS) = 56.90			

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.85 HALFSTREET FLOOD WIDTH(FEET) = 43.67
FLOW VELOCITY(FEET/SEC.) = 2.20 DEPTH*VELOCITY(FT*FT/SEC.) = 1.86
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 913.0 FT WITH ELEVATION-DROP = 2.0 FT, IS 39.9 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 318.00
LONGEST FLOWPATH FROM NODE 316.00 TO NODE 318.00 = 1243.00 FEET.

FLOW PROCESS FROM NODE 318.00 TO NODE 319.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 3 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 42.00 DOWNSTREAM ELEVATION(FEET) = 39.00
STREET LENGTH(FEET) = 1068.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 51.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 25.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 74.20

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

GC10

STREET FLOW DEPTH(FEET) = 0.88
 HALFSTREET FLOOD WIDTH(FEET) = 47.19
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.55
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.25
 STREET FLOW TRAVEL TIME(MIN.) = 6.98 Tc(MIN.) = 22.84
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.700
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	1.30	0.25	0.500	69
COMMERCIAL	C	20.90	0.25	0.100	69
COMMERCIAL	D	0.80	0.20	0.100	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.123
 SUBAREA AREA(ACRES) = 23.00 SUBAREA RUNOFF(CFS) = 34.56
 EFFECTIVE AREA(ACRES) = 53.70 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.13
 TOTAL AREA(ACRES) = 53.7 PEAK FLOW RATE(CFS) = 80.54

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.91 HALFSTREET FLOOD WIDTH(FEET) = 49.33
 FLOW VELOCITY(FEET/SEC.) = 2.58 DEPTH*VELOCITY(FT*FT/SEC.) = 2.34
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 1068.0 FT WITH ELEVATION-DROP = 3.0 FT, IS 42.5 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 319.00
 LONGEST FLOWPATH FROM NODE 316.00 TO NODE 319.00 = 2311.00 FEET.

FLOW PROCESS FROM NODE 319.00 TO NODE 320.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 3 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 39.00 DOWNSTREAM ELEVATION(FEET) = 34.00
 STREET LENGTH(FEET) = 1732.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 51.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 25.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 100.45
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.96
 HALFSTREET FLOOD WIDTH(FEET) = 54.80
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.72
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.62
 STREET FLOW TRAVEL TIME(MIN.) = 10.60 Tc(MIN.) = 33.44
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.366

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	1.70	0.25	0.500	69

GC10

RESIDENTIAL

"5-7 DWELLINGS/ACRE"	D	5.90	0.20	0.500	75
COMMERCIAL	C	2.10	0.25	0.100	69
COMMERCIAL	D	23.60	0.20	0.100	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.191
 SUBAREA AREA(ACRES) = 33.30 SUBAREA RUNOFF(CFS) = 39.76
 EFFECTIVE AREA(ACRES) = 87.00 AREA-AVERAGED Fm(INCH/HR) = 0.04
 AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 0.16
 TOTAL AREA(ACRES) = 87.0 PEAK FLOW RATE(CFS) = 104.18

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.97 HALFSTREET FLOOD WIDTH(FEET) = 55.78
 FLOW VELOCITY(FEET/SEC.) = 2.74 DEPTH*VELOCITY(FT*FT/SEC.) = 2.66
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 1732.0 FT WITH ELEVATION-DROP = 5.0 FT, IS 54.9 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 320.00
 LONGEST FLOWPATH FROM NODE 316.00 TO NODE 320.00 = 4043.00 FEET.

 FLOW PROCESS FROM NODE 320.00 TO NODE 321.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 34.00 DOWNSTREAM(FEET) = 33.00
 FLOW LENGTH(FEET) = 545.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 60.0 INCH PIPE IS 48.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.14
 ESTIMATED PIPE DIAMETER(INCH) = 60.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 104.18
 PIPE TRAVEL TIME(MIN.) = 1.48 Tc(MIN.) = 34.92
 LONGEST FLOWPATH FROM NODE 316.00 TO NODE 321.00 = 4588.00 FEET.

 FLOW PROCESS FROM NODE 321.00 TO NODE 321.00 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.) = 34.92
 RAINFALL INTENSITY(INCH/HR) = 1.33
 AREA-AVERAGED Fm(INCH/HR) = 0.04
 AREA-AVERAGED Fp(INCH/HR) = 0.23
 AREA-AVERAGED Ap = 0.16
 EFFECTIVE STREAM AREA(ACRES) = 87.00
 TOTAL STREAM AREA(ACRES) = 87.00
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 104.18

 FLOW PROCESS FROM NODE 321.00 TO NODE 322.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 42.00 DOWNSTREAM(FEET) = 40.00

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

GC10

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.986
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.586
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL "5-7 DWELLINGS/ACRE"	C	3.70	0.25	0.500	69	10.99
RESIDENTIAL "5-7 DWELLINGS/ACRE"	D	0.10	0.20	0.500	75	10.99

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.500
 SUBAREA RUNOFF(CFS) = 8.42
 TOTAL AREA(ACRES) = 3.80 PEAK FLOW RATE(CFS) = 8.42

FLOW PROCESS FROM NODE 322.00 TO NODE 323.00 IS CODE = 62

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 40.00 DOWNSTREAM ELEVATION(FEET) = 38.00
 STREET LENGTH(FEET) = 1467.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.38
 STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.60
 HALFSTREET FLOOD WIDTH(FEET) = 24.93
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.52
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.91
 STREET FLOW TRAVEL TIME(MIN.) = 16.07 Tc(MIN.) = 27.06
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.543

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL "5-7 DWELLINGS/ACRE"	C	3.20	0.25	0.500	69
RESIDENTIAL "5-7 DWELLINGS/ACRE"	D	7.60	0.20	0.500	75
COMMERCIAL	C	1.00	0.25	0.100	69
COMMERCIAL	D	2.90	0.20	0.100	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.394
 SUBAREA AREA(ACRES) = 14.70 SUBAREA RUNOFF(CFS) = 19.29
 EFFECTIVE AREA(ACRES) = 18.50 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.22 AREA-AVERAGED Ap = 0.42
 TOTAL AREA(ACRES) = 18.5 PEAK FLOW RATE(CFS) = 24.14

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.65 HALFSTREET FLOOD WIDTH(FEET) = 27.37

GC10

FLOW VELOCITY(FEET/SEC.) = 1.65 DEPTH*VELOCITY(FT*FT/SEC.) = 1.07

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 1467.0 FT WITH ELEVATION-DROP = 2.0 FT, IS 22.5 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 323.00
LONGEST FLOWPATH FROM NODE 321.00 TO NODE 323.00 = 1797.00 FEET.

FLOW PROCESS FROM NODE 323.00 TO NODE 324.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 38.00 DOWNSTREAM ELEVATION(FEET) = 33.00
STREET LENGTH(FEET) = 1382.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 37.97
STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.64
HALFSTREET FLOOD WIDTH(FEET) = 27.01
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.67
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.71
STREET FLOW TRAVEL TIME(MIN.) = 8.63 Tc(MIN.) = 35.69
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.316

SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Rows include RESIDENTIAL, COMMERCIAL, URBAN POOR COVER, and SCHOOL.

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.452
SUBAREA AREA(ACRES) = 25.00 SUBAREA RUNOFF(CFS) = 27.58
EFFECTIVE AREA(ACRES) = 43.50 AREA-AVERAGED Fm(INCH/HR) = 0.09
AREA-AVERAGED Fp(INCH/HR) = 0.21 AREA-AVERAGED Ap = 0.44
TOTAL AREA(ACRES) = 43.5 PEAK FLOW RATE(CFS) = 47.96

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.69 HALFSTREET FLOOD WIDTH(FEET) = 29.39
FLOW VELOCITY(FEET/SEC.) = 2.83 DEPTH*VELOCITY(FT*FT/SEC.) = 1.95

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 1382.0 FT WITH ELEVATION-DROP = 5.0 FT, IS 43.5 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 324.00
LONGEST FLOWPATH FROM NODE 321.00 TO NODE 324.00 = 3179.00 FEET.

FLOW PROCESS FROM NODE 324.00 TO NODE 324.00 IS CODE = 1

GC10

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 35.69
 RAINFALL INTENSITY(INCH/HR) = 1.32
 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.21
 AREA-AVERAGED Ap = 0.44
 EFFECTIVE STREAM AREA(ACRES) = 43.50
 TOTAL STREAM AREA(ACRES) = 43.50
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 47.96

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	104.18	34.92	1.333	0.23(0.04)	0.16	87.0	316.00
2	47.96	35.69	1.316	0.21(0.09)	0.44	43.5	321.00

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	151.73	34.92	1.333	0.22(0.05)	0.25	129.6	316.00
2	150.80	35.69	1.316	0.22(0.05)	0.25	130.5	321.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 151.73 Tc(MIN.) = 34.92
 EFFECTIVE AREA(ACRES) = 129.56 AREA-AVERAGED Fm(INCH/HR) = 0.05
 AREA-AVERAGED Fp(INCH/HR) = 0.22 AREA-AVERAGED Ap = 0.25
 TOTAL AREA(ACRES) = 130.5
 LONGEST FLOWPATH FROM NODE 316.00 TO NODE 324.00 = 4588.00 FEET.

FLOW PROCESS FROM NODE 324.00 TO NODE 325.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 33.00 DOWNSTREAM(FEET) = 32.50
 FLOW LENGTH(FEET) = 167.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 63.0 INCH PIPE IS 50.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 8.11
 ESTIMATED PIPE DIAMETER(INCH) = 63.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 151.73
 PIPE TRAVEL TIME(MIN.) = 0.34 Tc(MIN.) = 35.26
 LONGEST FLOWPATH FROM NODE 316.00 TO NODE 325.00 = 4755.00 FEET.

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 | END OF SYSTEM |
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FLOW PROCESS FROM NODE 326.00 TO NODE 327.00 IS CODE = 21

GC10

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 38.00 DOWNSTREAM(FEET) = 36.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.586
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	D	1.60	0.20	0.500	75	10.99
COMMERCIAL	D	0.50	0.20	0.100	75	8.59

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.405
 SUBAREA RUNOFF(CFS) = 5.48
 TOTAL AREA(ACRES) = 2.10 PEAK FLOW RATE(CFS) = 5.48

FLOW PROCESS FROM NODE 327.00 TO NODE 328.00 IS CODE = 62

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<
 =====

UPSTREAM ELEVATION(FEET) = 36.00 DOWNSTREAM ELEVATION(FEET) = 34.00
 STREET LENGTH(FEET) = 607.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.13
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.46
 HALFSTREET FLOOD WIDTH(FEET) = 17.23
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.79
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.82
 STREET FLOW TRAVEL TIME(MIN.) = 5.67 Tc(MIN.) = 14.25
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.228

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	3.70	0.20	0.500	75
COMMERCIAL	D	1.70	0.20	0.100	75
URBAN POOR COVER					
"TURF"	D	0.40	0.20	1.000	87

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.417
 SUBAREA AREA(ACRES) = 5.80 SUBAREA RUNOFF(CFS) = 11.19
 EFFECTIVE AREA(ACRES) = 7.90 AREA-AVERAGED Fm(INCH/HR) = 0.08

GC10

AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.41
TOTAL AREA(ACRES) = 7.9 PEAK FLOW RATE(CFS) = 15.25

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.51 HALFSTREET FLOOD WIDTH(FEET) = 19.80
FLOW VELOCITY(FEET/SEC.) = 1.93 DEPTH*VELOCITY(FT*FT/SEC.) = 0.98
LONGEST FLOWPATH FROM NODE 326.00 TO NODE 328.00 = 937.00 FEET.

FLOW PROCESS FROM NODE 328.00 TO NODE 329.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 34.00 DOWNSTREAM(FEET) = 33.00
FLOW LENGTH(FEET) = 190.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 24.0 INCH PIPE IS 19.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.65
ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 15.25
PIPE TRAVEL TIME(MIN.) = 0.56 Tc(MIN.) = 14.81
LONGEST FLOWPATH FROM NODE 326.00 TO NODE 329.00 = 1127.00 FEET.

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| END OF SYSTEM |
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FLOW PROCESS FROM NODE 330.00 TO NODE 331.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 34.00 DOWNSTREAM(FEET) = 33.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.862
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	D	1.40	0.20	0.500	75	12.62
COMMERCIAL	D	0.50	0.20	0.100	75	9.86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.395
SUBAREA RUNOFF(CFS) = 4.57
TOTAL AREA(ACRES) = 1.90 PEAK FLOW RATE(CFS) = 4.57

FLOW PROCESS FROM NODE 331.00 TO NODE 332.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 33.00 DOWNSTREAM ELEVATION(FEET) = 32.50
STREET LENGTH(FEET) = 80.00 CURB HEIGHT(INCHES) = 6.0

GC10

STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.95

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.42

HALFSTREET FLOOD WIDTH(FEET) = 15.04

AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.27

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.95

STREET FLOW TRAVEL TIME(MIN.) = 0.59 Tc(MIN.) = 10.45

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.661

SUBAREA LOSS RATE DATA(AMC II):

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

"5-7 DWELLINGS/ACRE" D 4.20 0.20 0.500 75

COMMERCIAL D 1.30 0.20 0.100 75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.405

SUBAREA AREA(ACRES) = 5.50 SUBAREA RUNOFF(CFS) = 12.77

EFFECTIVE AREA(ACRES) = 7.40 AREA-AVERAGED Fm(INCH/HR) = 0.08

AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.40

TOTAL AREA(ACRES) = 7.4 PEAK FLOW RATE(CFS) = 17.19

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 18.01

FLOW VELOCITY(FEET/SEC.) = 2.53 DEPTH*VELOCITY(FT*FT/SEC.) = 1.21

LONGEST FLOWPATH FROM NODE 330.00 TO NODE 332.00 = 410.00 FEET.

FLOW PROCESS FROM NODE 332.00 TO NODE 333.00 IS CODE = 31

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

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 32.50 DOWNSTREAM(FEET) = 32.00

FLOW LENGTH(FEET) = 451.00 MANNING'S N = 0.013

DEPTH OF FLOW IN 36.0 INCH PIPE IS 24.7 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 3.32

ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) = 17.19

PIPE TRAVEL TIME(MIN.) = 2.26 Tc(MIN.) = 12.71

LONGEST FLOWPATH FROM NODE 330.00 TO NODE 333.00 = 861.00 FEET.

FLOW PROCESS FROM NODE 333.00 TO NODE 333.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN.) = 12.71

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.378

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	GC10 Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	2.90	0.20	0.500	75
COMMERCIAL	D	0.90	0.20	0.100	75
URBAN POOR COVER					
"TURF"	D	0.50	0.20	1.000	87

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.474
 SUBAREA AREA(ACRES) = 4.30 SUBAREA RUNOFF(CFS) = 8.84
 EFFECTIVE AREA(ACRES) = 11.70 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.43
 TOTAL AREA(ACRES) = 11.7 PEAK FLOW RATE(CFS) = 24.14

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| END OF SYSTEM |
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*****
FLOW PROCESS FROM NODE 334.00 TO NODE 335.00 IS CODE = 21

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

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=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 38.00 DOWNSTREAM(FEET) = 36.00

```

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.586
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	D	0.90	0.20	0.500	75	10.99
COMMERCIAL	D	0.50	0.20	0.100	75	8.59

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.357
 SUBAREA RUNOFF(CFS) = 3.66
 TOTAL AREA(ACRES) = 1.40 PEAK FLOW RATE(CFS) = 3.66

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*****
FLOW PROCESS FROM NODE 335.00 TO NODE 336.00 IS CODE = 62

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>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<

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=====
UPSTREAM ELEVATION(FEET) = 36.00 DOWNSTREAM ELEVATION(FEET) = 34.00
STREET LENGTH(FEET) = 715.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

```

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

GC10

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.71

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.41

HALFSTREET FLOOD WIDTH(FEET) = 14.57

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.48

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.60

STREET FLOW TRAVEL TIME(MIN.) = 8.06 Tc(MIN.) = 16.65

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.038

SUBAREA LOSS RATE DATA(AMC II):

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

"5-7 DWELLINGS/ACRE" D 2.30 0.20 0.500 75

COMMERCIAL D 1.10 0.20 0.100 75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.371

SUBAREA AREA(ACRES) = 3.40 SUBAREA RUNOFF(CFS) = 6.01

EFFECTIVE AREA(ACRES) = 4.80 AREA-AVERAGED Fm(INCH/HR) = 0.07

AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.37

TOTAL AREA(ACRES) = 4.8 PEAK FLOW RATE(CFS) = 8.49

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.44 HALFSTREET FLOOD WIDTH(FEET) = 15.98

FLOW VELOCITY(FEET/SEC.) = 1.57 DEPTH*VELOCITY(FT*FT/SEC.) = 0.68

LONGEST FLOWPATH FROM NODE 334.00 TO NODE 336.00 = 1045.00 FEET.

FLOW PROCESS FROM NODE 336.00 TO NODE 337.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 34.00 DOWNSTREAM ELEVATION(FEET) = 33.00

STREET LENGTH(FEET) = 277.00 CURB HEIGHT(INCHES) = 6.0

STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.06

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.45

HALFSTREET FLOOD WIDTH(FEET) = 16.91

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.84

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.84

STREET FLOW TRAVEL TIME(MIN.) = 2.51 Tc(MIN.) = 19.16

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.880

SUBAREA LOSS RATE DATA(AMC II):

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

"5-7 DWELLINGS/ACRE" D 2.40 0.20 0.500 75

GC10

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COMMERCIAL          D          0.60      0.20      0.100      75
URBAN POOR COVER
"TURF"             D          0.20      0.20      1.000      87
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.456
SUBAREA AREA(ACRES) = 3.20      SUBAREA RUNOFF(CFS) = 5.15
EFFECTIVE AREA(ACRES) = 8.00      AREA-AVERAGED Fm(INCH/HR) = 0.08
AREA-AVERAGED Fp(INCH/HR) = 0.20  AREA-AVERAGED Ap = 0.40
TOTAL AREA(ACRES) = 8.0      PEAK FLOW RATE(CFS) = 12.96

```

END OF SUBAREA STREET FLOW HYDRAULICS:

```

DEPTH(FEET) = 0.48  HALFSTREET FLOOD WIDTH(FEET) = 18.01
FLOW VELOCITY(FEET/SEC.) = 1.91  DEPTH*VELOCITY(FT*FT/SEC.) = 0.91
LONGEST FLOWPATH FROM NODE 334.00 TO NODE 337.00 = 1322.00 FEET.

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FLOW PROCESS FROM NODE 337.00 TO NODE 338.00 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) = 33.00  DOWNSTREAM(FEET) = 32.50
FLOW LENGTH(FEET) = 119.00  MANNING'S N = 0.013
DEPTH OF FLOW IN 24.0 INCH PIPE IS 18.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.03
ESTIMATED PIPE DIAMETER(INCH) = 24.00  NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 12.96
PIPE TRAVEL TIME(MIN.) = 0.39  Tc(MIN.) = 19.55
LONGEST FLOWPATH FROM NODE 334.00 TO NODE 338.00 = 1441.00 FEET.

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+-----+
| END OF SYSTEM |
+-----+

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FLOW PROCESS FROM NODE 339.00 TO NODE 340.00 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) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 39.00  DOWNSTREAM(FEET) = 38.50

```

$$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$$

```

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.329

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```

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.541

```

```

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.)
APARTMENTS	D	2.80	0.20	0.200	75	12.07
COMMERCIAL	D	4.00	0.20	0.100	75	11.33

```

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

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```

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.141

```

```

SUBAREA RUNOFF(CFS) = 15.38

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TOTAL AREA(ACRES) = 6.80  PEAK FLOW RATE(CFS) = 15.38

```

```

FLOW PROCESS FROM NODE 340.00 TO NODE 341.00 IS CODE = 62

```

GC10

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 2 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 38.50 DOWNSTREAM ELEVATION(FEET) = 38.00
 STREET LENGTH(FEET) = 337.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 21.81
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.68
 HALFSTREET FLOOD WIDTH(FEET) = 26.83
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.55
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.06
 STREET FLOW TRAVEL TIME(MIN.) = 3.62 Tc(MIN.) = 14.94
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.168

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
APARTMENTS	D	5.80	0.20	0.200	75
COMMERCIAL	D	0.90	0.20	0.100	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.187
 SUBAREA AREA(ACRES) = 6.70 SUBAREA RUNOFF(CFS) = 12.85
 EFFECTIVE AREA(ACRES) = 13.50 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.16
 TOTAL AREA(ACRES) = 13.5 PEAK FLOW RATE(CFS) = 25.94

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.72 HALFSTREET FLOOD WIDTH(FEET) = 30.28
 FLOW VELOCITY(FEET/SEC.) = 1.62 DEPTH*VELOCITY(FT*FT/SEC.) = 1.16
 LONGEST FLOWPATH FROM NODE 339.00 TO NODE 341.00 = 667.00 FEET.

 FLOW PROCESS FROM NODE 341.00 TO NODE 346.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 38.00 DOWNSTREAM(FEET) = 37.50
 FLOW LENGTH(FEET) = 637.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 42.0 INCH PIPE IS 33.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 3.17
 ESTIMATED PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 25.94
 PIPE TRAVEL TIME(MIN.) = 3.35 Tc(MIN.) = 18.30
 LONGEST FLOWPATH FROM NODE 339.00 TO NODE 346.00 = 1304.00 FEET.

 FLOW PROCESS FROM NODE 346.00 TO NODE 346.00 IS CODE = 1

GC10

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

```
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 18.30
RAINFALL INTENSITY(INCH/HR) = 1.93
AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.20
AREA-AVERAGED Ap = 0.16
EFFECTIVE STREAM AREA(ACRES) = 13.50
TOTAL STREAM AREA(ACRES) = 13.50
PEAK FLOW RATE(CFS) AT CONFLUENCE = 25.94
```

FLOW PROCESS FROM NODE 342.00 TO NODE 343.00 IS CODE = 21

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

```
=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 39.00 DOWNSTREAM(FEET) = 38.50
```

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.329
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.541

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	D	1.50	0.20	0.500	75	14.50
COMMERCIAL	D	0.60	0.20	0.100	75	11.33

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.386

SUBAREA RUNOFF(CFS) = 4.66

TOTAL AREA(ACRES) = 2.10 PEAK FLOW RATE(CFS) = 4.66

FLOW PROCESS FROM NODE 343.00 TO NODE 344.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

```
=====
UPSTREAM ELEVATION(FEET) = 38.50 DOWNSTREAM ELEVATION(FEET) = 38.00
STREET LENGTH(FEET) = 502.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00
```

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.91

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.50

HALFSTREET FLOOD WIDTH(FEET) = 19.10

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.04

GC10

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.52
 STREET FLOW TRAVEL TIME(MIN.) = 8.03 Tc(MIN.) = 19.36
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.869
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	3.00	0.20	0.500	75
COMMERCIAL	D	1.00	0.20	0.100	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.400
 SUBAREA AREA(ACRES) = 4.00 SUBAREA RUNOFF(CFS) = 6.44
 EFFECTIVE AREA(ACRES) = 6.10 AREA-AVERAGED Fm(INCH/HR) = 0.08
 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.40
 TOTAL AREA(ACRES) = 6.1 PEAK FLOW RATE(CFS) = 9.83

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.53 HALFSTREET FLOOD WIDTH(FEET) = 21.45
 FLOW VELOCITY(FEET/SEC.) = 1.11 DEPTH*VELOCITY(FT*FT/SEC.) = 0.59
 LONGEST FLOWPATH FROM NODE 342.00 TO NODE 344.00 = 832.00 FEET.

FLOW PROCESS FROM NODE 344.00 TO NODE 345.00 IS CODE = 62

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 38.00 DOWNSTREAM ELEVATION(FEET) = 37.70
 STREET LENGTH(FEET) = 533.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.96
 STREET FLOWING FULL
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.69
 HALFSTREET FLOOD WIDTH(FEET) = 29.39
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.12
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.77
 STREET FLOW TRAVEL TIME(MIN.) = 7.93 Tc(MIN.) = 27.29
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.535

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	10.70	0.20	0.500	75
COMMERCIAL	D	3.20	0.20	0.100	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.408
 SUBAREA AREA(ACRES) = 13.90 SUBAREA RUNOFF(CFS) = 18.19
 EFFECTIVE AREA(ACRES) = 20.00 AREA-AVERAGED Fm(INCH/HR) = 0.08
 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.40

GC10

TOTAL AREA(ACRES) = 20.0 PEAK FLOW RATE(CFS) = 26.18

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.76 HALFSTREET FLOOD WIDTH(FEET) = 33.05
 FLOW VELOCITY(FEET/SEC.) = 1.22 DEPTH*VELOCITY(FT*FT/SEC.) = 0.93
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 533.0 FT WITH ELEVATION-DROP = 0.3 FT, IS 24.4 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 345.00
 LONGEST FLOWPATH FROM NODE 342.00 TO NODE 345.00 = 1365.00 FEET.

FLOW PROCESS FROM NODE 345.00 TO NODE 346.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 37.70 DOWNSTREAM(FEET) = 37.50
 FLOW LENGTH(FEET) = 813.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 54.0 INCH PIPE IS 39.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 2.08
 ESTIMATED PIPE DIAMETER(INCH) = 54.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 26.18
 PIPE TRAVEL TIME(MIN.) = 6.51 Tc(MIN.) = 33.80
 LONGEST FLOWPATH FROM NODE 342.00 TO NODE 346.00 = 2178.00 FEET.

FLOW PROCESS FROM NODE 346.00 TO NODE 346.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 33.80
 RAINFALL INTENSITY(INCH/HR) = 1.36
 AREA-AVERAGED Fm(INCH/HR) = 0.08
 AREA-AVERAGED Fp(INCH/HR) = 0.20
 AREA-AVERAGED Ap = 0.40
 EFFECTIVE STREAM AREA(ACRES) = 20.00
 TOTAL STREAM AREA(ACRES) = 20.00
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 26.18

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25.94	18.30	1.930	0.20(0.03)	0.16	13.5	339.00
2	26.18	33.80	1.358	0.20(0.08)	0.40	20.0	342.00

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	46.46	18.30	1.930	0.20(0.05)	0.27	24.3	339.00
2	44.30	33.80	1.358	0.20(0.06)	0.31	33.5	342.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 46.46 Tc(MIN.) = 18.30
 EFFECTIVE AREA(ACRES) = 24.33 AREA-AVERAGED Fm(INCH/HR) = 0.05

GC10

AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.27
TOTAL AREA(ACRES) = 33.5
LONGEST FLOWPATH FROM NODE 342.00 TO NODE 346.00 = 2178.00 FEET.

FLOW PROCESS FROM NODE 346.00 TO NODE 347.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 37.50 DOWNSTREAM(FEET) = 37.00
FLOW LENGTH(FEET) = 1007.75 MANNING'S N = 0.013
DEPTH OF FLOW IN 57.0 INCH PIPE IS 45.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 3.09
ESTIMATED PIPE DIAMETER(INCH) = 57.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 46.46
PIPE TRAVEL TIME(MIN.) = 5.44 Tc(MIN.) = 23.74
LONGEST FLOWPATH FROM NODE 342.00 TO NODE 347.00 = 3185.75 FEET.

FLOW PROCESS FROM NODE 347.00 TO NODE 347.00 IS CODE = 81

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

MAINLINE Tc(MIN.) = 23.74
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.663
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"5-7 DWELLINGS/ACRE" D 0.40 0.20 0.500 75
APARTMENTS D 4.70 0.20 0.200 75
COMMERCIAL D 8.50 0.20 0.100 75
URBAN POOR COVER
"TURF" D 5.10 0.20 1.000 87
SCHOOL D 10.20 0.20 0.600 75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.457
SUBAREA AREA(ACRES) = 28.90 SUBAREA RUNOFF(CFS) = 40.87
EFFECTIVE AREA(ACRES) = 53.23 AREA-AVERAGED Fm(INCH/HR) = 0.07
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.37
TOTAL AREA(ACRES) = 62.4 PEAK FLOW RATE(CFS) = 76.09

END OF SYSTEM

FLOW PROCESS FROM NODE 348.00 TO NODE 349.00 IS CODE = 21

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 36.00 DOWNSTREAM(FEET) = 35.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.862

GC10

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	D	0.70	0.20	0.500	75	12.62
COMMERCIAL	D	0.40	0.20	0.100	75	9.86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.355
SUBAREA RUNOFF(CFS) = 2.65
TOTAL AREA(ACRES) = 1.10 PEAK FLOW RATE(CFS) = 2.65

FLOW PROCESS FROM NODE 349.00 TO NODE 350.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 35.00 DOWNSTREAM ELEVATION(FEET) = 34.00
STREET LENGTH(FEET) = 487.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.25
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.40
HALFSTREET FLOOD WIDTH(FEET) = 14.02
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.24
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.49
STREET FLOW TRAVEL TIME(MIN.) = 6.53 Tc(MIN.) = 16.40
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.056

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	2.20	0.20	0.500	75
COMMERCIAL	D	0.70	0.20	0.100	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.403
SUBAREA AREA(ACRES) = 2.90 SUBAREA RUNOFF(CFS) = 5.15
EFFECTIVE AREA(ACRES) = 4.00 AREA-AVERAGED Fm(INCH/HR) = 0.08
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.39
TOTAL AREA(ACRES) = 4.0 PEAK FLOW RATE(CFS) = 7.12

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.43 HALFSTREET FLOOD WIDTH(FEET) = 15.82
FLOW VELOCITY(FEET/SEC.) = 1.34 DEPTH*VELOCITY(FT*FT/SEC.) = 0.58
LONGEST FLOWPATH FROM NODE 348.00 TO NODE 350.00 = 817.00 FEET.

FLOW PROCESS FROM NODE 350.00 TO NODE 351.00 IS CODE = 62

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>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 34.00 DOWNSTREAM ELEVATION(FEET) = 33.00
 STREET LENGTH(FEET) = 841.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.84
 STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.53
 HALFSTREET FLOOD WIDTH(FEET) = 21.51
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.22
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.65
 STREET FLOW TRAVEL TIME(MIN.) = 11.52 Tc(MIN.) = 27.91
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.515

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	4.40	0.20	0.500	75
COMMERCIAL	D	1.30	0.20	0.100	75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.409					
SUBAREA AREA(ACRES) = 5.70		SUBAREA RUNOFF(CFS) = 7.35			
EFFECTIVE AREA(ACRES) = 9.70		AREA-AVERAGED Fm(INCH/HR) = 0.08			
AREA-AVERAGED Fp(INCH/HR) = 0.20		AREA-AVERAGED Ap = 0.40			
TOTAL AREA(ACRES) = 9.7		PEAK FLOW RATE(CFS) = 12.53			

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.55 HALFSTREET FLOOD WIDTH(FEET) = 22.49
 FLOW VELOCITY(FEET/SEC.) = 1.28 DEPTH*VELOCITY(FT*FT/SEC.) = 0.71
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 841.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 9.8 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 351.00
 LONGEST FLOWPATH FROM NODE 348.00 TO NODE 351.00 = 1658.00 FEET.

FLOW PROCESS FROM NODE 351.00 TO NODE 364.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 33.00 DOWNSTREAM(FEET) = 32.50
 FLOW LENGTH(FEET) = 329.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 30.0 INCH PIPE IS 20.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 3.45
 ESTIMATED PIPE DIAMETER(INCH) = 30.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 12.53
 PIPE TRAVEL TIME(MIN.) = 1.59 Tc(MIN.) = 29.50
 LONGEST FLOWPATH FROM NODE 348.00 TO NODE 364.00 = 1987.00 FEET.

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 FLOW PROCESS FROM NODE 364.00 TO NODE 364.00 IS CODE = 10

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

 FLOW PROCESS FROM NODE 352.00 TO NODE 353.00 IS CODE = 21

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 34.00 DOWNSTREAM(FEET) = 33.50

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.329
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.541

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	D	1.90	0.20	0.500	75	14.50
COMMERCIAL	D	0.50	0.20	0.100	75	11.33

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.417

SUBAREA RUNOFF(CFS) = 5.31

TOTAL AREA(ACRES) = 2.40 PEAK FLOW RATE(CFS) = 5.31

 FLOW PROCESS FROM NODE 353.00 TO NODE 354.00 IS CODE = 62

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<
 =====

UPSTREAM ELEVATION(FEET) = 33.50 DOWNSTREAM ELEVATION(FEET) = 33.00
 STREET LENGTH(FEET) = 320.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.31

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.45

HALFSTREET FLOOD WIDTH(FEET) = 16.91

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.22

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.55

STREET FLOW TRAVEL TIME(MIN.) = 4.39 Tc(MIN.) = 15.72

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.106

SUBAREA LOSS RATE DATA(AMC II):

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

GC10

RESIDENTIAL

"5-7 DWELLINGS/ACRE" D 1.80 0.20 0.500 75
COMMERCIAL D 0.40 0.20 0.100 75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.427
SUBAREA AREA(ACRES) = 2.20 SUBAREA RUNOFF(CFS) = 4.00
EFFECTIVE AREA(ACRES) = 4.60 AREA-AVERAGED Fm(INCH/HR) = 0.08
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.42
TOTAL AREA(ACRES) = 4.6 PEAK FLOW RATE(CFS) = 8.37

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.47 HALFSTREET FLOOD WIDTH(FEET) = 17.85
FLOW VELOCITY(FEET/SEC.) = 1.26 DEPTH*VELOCITY(FT*FT/SEC.) = 0.59
LONGEST FLOWPATH FROM NODE 352.00 TO NODE 354.00 = 650.00 FEET.

FLOW PROCESS FROM NODE 354.00 TO NODE 363.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 33.00 DOWNSTREAM(FEET) = 32.70
FLOW LENGTH(FEET) = 477.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 30.0 INCH PIPE IS 21.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 2.23
ESTIMATED PIPE DIAMETER(INCH) = 30.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 8.37
PIPE TRAVEL TIME(MIN.) = 3.56 Tc(MIN.) = 19.27
LONGEST FLOWPATH FROM NODE 352.00 TO NODE 363.00 = 1127.00 FEET.

FLOW PROCESS FROM NODE 363.00 TO NODE 363.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 3
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 19.27
RAINFALL INTENSITY(INCH/HR) = 1.87
AREA-AVERAGED Fm(INCH/HR) = 0.08
AREA-AVERAGED Fp(INCH/HR) = 0.20
AREA-AVERAGED Ap = 0.42
EFFECTIVE STREAM AREA(ACRES) = 4.60
TOTAL STREAM AREA(ACRES) = 4.60
PEAK FLOW RATE(CFS) AT CONFLUENCE = 8.37

FLOW PROCESS FROM NODE 355.00 TO NODE 356.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 35.00 DOWNSTREAM(FEET) = 34.50

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.329
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.541

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS	Tc
						170

LAND USE	GROUP	(ACRES)	GC10 (INCH/HR)	(DECIMAL)	CN	(MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	D	1.60	0.20	0.500	75	14.50
COMMERCIAL	D	0.50	0.20	0.100	75	11.33
URBAN POOR COVER						
"TURF"	D	0.10	0.20	1.000	87	19.56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.432
 SUBAREA RUNOFF(CFS) = 4.86
 TOTAL AREA(ACRES) = 2.20 PEAK FLOW RATE(CFS) = 4.86

 FLOW PROCESS FROM NODE 356.00 TO NODE 357.00 IS CODE = 62

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 34.50 DOWNSTREAM ELEVATION(FEET) = 34.00
 STREET LENGTH(FEET) = 351.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8.99
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.49
 HALFSTREET FLOOD WIDTH(FEET) = 18.71
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.23
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.60
 STREET FLOW TRAVEL TIME(MIN.) = 4.75 Tc(MIN.) = 16.08
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.079

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	3.00	0.20	0.500	75
COMMERCIAL	D	1.10	0.20	0.100	75
URBAN POOR COVER					
"TURF"	D	0.50	0.20	1.000	87

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.459
 SUBAREA AREA(ACRES) = 4.60 SUBAREA RUNOFF(CFS) = 8.23
 EFFECTIVE AREA(ACRES) = 6.80 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.45
 TOTAL AREA(ACRES) = 6.8 PEAK FLOW RATE(CFS) = 12.17

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.53 HALFSTREET FLOOD WIDTH(FEET) = 21.64
 FLOW VELOCITY(FEET/SEC.) = 1.35 DEPTH*VELOCITY(FT*FT/SEC.) = 0.72
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 351.0 FT WITH ELEVATION-DROP = 0.5 FT, IS 9.9 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 357.00
 LONGEST FLOWPATH FROM NODE 355.00 TO NODE 357.00 = 681.00 FEET.

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FLOW PROCESS FROM NODE 357.00 TO NODE 358.00 IS CODE = 62

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 34.00 DOWNSTREAM ELEVATION(FEET) = 33.50
 STREET LENGTH(FEET) = 586.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14.79
 STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.60
 HALFSTREET FLOOD WIDTH(FEET) = 25.05
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.21
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.73
 STREET FLOW TRAVEL TIME(MIN.) = 8.06 Tc(MIN.) = 24.13
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.647

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	2.90	0.20	0.500	75
COMMERCIAL	D	0.80	0.20	0.100	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.414
 SUBAREA AREA(ACRES) = 3.70 SUBAREA RUNOFF(CFS) = 5.21
 EFFECTIVE AREA(ACRES) = 10.50 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.44
 TOTAL AREA(ACRES) = 10.5 PEAK FLOW RATE(CFS) = 14.74

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.60 HALFSTREET FLOOD WIDTH(FEET) = 25.05
 FLOW VELOCITY(FEET/SEC.) = 1.21 DEPTH*VELOCITY(FT*FT/SEC.) = 0.73
 LONGEST FLOWPATH FROM NODE 355.00 TO NODE 358.00 = 1267.00 FEET.

FLOW PROCESS FROM NODE 358.00 TO NODE 363.00 IS CODE = 31

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

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 33.50 DOWNSTREAM(FEET) = 32.70
 FLOW LENGTH(FEET) = 739.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 33.0 INCH PIPE IS 24.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 3.14
 ESTIMATED PIPE DIAMETER(INCH) = 33.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 14.74
 PIPE TRAVEL TIME(MIN.) = 3.92 Tc(MIN.) = 28.05

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LONGEST FLOWPATH FROM NODE 355.00 TO NODE 363.00 = 2006.00 FEET.

FLOW PROCESS FROM NODE 363.00 TO NODE 363.00 IS CODE = 1

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

TOTAL NUMBER OF STREAMS = 3
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 28.05
RAINFALL INTENSITY(INCH/HR) = 1.51
AREA-AVERAGED Fm(INCH/HR) = 0.09
AREA-AVERAGED Fp(INCH/HR) = 0.20
AREA-AVERAGED Ap = 0.44
EFFECTIVE STREAM AREA(ACRES) = 10.50
TOTAL STREAM AREA(ACRES) = 10.50
PEAK FLOW RATE(CFS) AT CONFLUENCE = 14.74

FLOW PROCESS FROM NODE 359.00 TO NODE 360.00 IS CODE = 21

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 36.00 DOWNSTREAM(FEET) = 35.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.862
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751
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.)
RESIDENTIAL
"5-7 DWELLINGS/ACRE" D 2.40 0.20 0.500 75 12.62
COMMERCIAL D 0.50 0.20 0.100 75 9.86
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.431
SUBAREA RUNOFF(CFS) = 6.95
TOTAL AREA(ACRES) = 2.90 PEAK FLOW RATE(CFS) = 6.95

FLOW PROCESS FROM NODE 360.00 TO NODE 361.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 35.00 DOWNSTREAM ELEVATION(FEET) = 34.00
STREET LENGTH(FEET) = 1191.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

GC10

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.29

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.57

HALFSTREET FLOOD WIDTH(FEET) = 23.65

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.13

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.65

STREET FLOW TRAVEL TIME(MIN.) = 17.49 Tc(MIN.) = 27.36

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.533

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	5.60	0.20	0.500	75
COMMERCIAL	D	2.00	0.20	0.100	75
URBAN POOR COVER					
"TURF"	D	0.30	0.20	1.000	87

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.418

SUBAREA AREA(ACRES) = 7.90 SUBAREA RUNOFF(CFS) = 10.31

EFFECTIVE AREA(ACRES) = 10.80 AREA-AVERAGED Fm(INCH/HR) = 0.08

AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.42

TOTAL AREA(ACRES) = 10.8 PEAK FLOW RATE(CFS) = 14.08

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 24.69

FLOW VELOCITY(FEET/SEC.) = 1.19 DEPTH*VELOCITY(FT*FT/SEC.) = 0.71

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 1191.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 12.0 CFS,

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 361.00

LONGEST FLOWPATH FROM NODE 359.00 TO NODE 361.00 = 1521.00 FEET.

FLOW PROCESS FROM NODE 361.00 TO NODE 363.00 IS CODE = 31

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

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 34.00 DOWNSTREAM(FEET) = 32.70

FLOW LENGTH(FEET) = 743.00 MANNING'S N = 0.013

DEPTH OF FLOW IN 30.0 INCH PIPE IS 21.5 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 3.73

ESTIMATED PIPE DIAMETER(INCH) = 30.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) = 14.08

PIPE TRAVEL TIME(MIN.) = 3.32 Tc(MIN.) = 30.67

LONGEST FLOWPATH FROM NODE 359.00 TO NODE 363.00 = 2264.00 FEET.

FLOW PROCESS FROM NODE 363.00 TO NODE 363.00 IS CODE = 1

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

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 3

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 3 ARE:

TIME OF CONCENTRATION(MIN.) = 30.67

RAINFALL INTENSITY(INCH/HR) = 1.44

AREA-AVERAGED Fm(INCH/HR) = 0.08

AREA-AVERAGED Fp(INCH/HR) = 0.20

AREA-AVERAGED Ap = 0.42

GC10

EFFECTIVE STREAM AREA(ACRES) = 10.80
 TOTAL STREAM AREA(ACRES) = 10.80
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 14.08

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8.37	19.27	1.874	0.20(0.08)	0.42	4.6	352.00
2	14.74	28.05	1.511	0.20(0.09)	0.44	10.5	355.00
3	14.08	30.67	1.436	0.20(0.08)	0.42	10.8	359.00

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	32.79	19.27	1.874	0.20(0.09)	0.43	18.6	352.00
2	35.01	28.05	1.511	0.20(0.09)	0.43	25.0	355.00
3	34.36	30.67	1.436	0.20(0.09)	0.43	25.9	359.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 35.01 Tc(MIN.) = 28.05
 EFFECTIVE AREA(ACRES) = 24.98 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.43
 TOTAL AREA(ACRES) = 25.9
 LONGEST FLOWPATH FROM NODE 359.00 TO NODE 363.00 = 2264.00 FEET.

FLOW PROCESS FROM NODE 363.00 TO NODE 364.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 32.70 DOWNSTREAM(FEET) = 32.50
 FLOW LENGTH(FEET) = 170.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 33.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 4.03
 ESTIMATED PIPE DIAMETER(INCH) = 45.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 35.01
 PIPE TRAVEL TIME(MIN.) = 0.70 Tc(MIN.) = 28.76
 LONGEST FLOWPATH FROM NODE 359.00 TO NODE 364.00 = 2434.00 FEET.

FLOW PROCESS FROM NODE 364.00 TO NODE 364.00 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	32.79	19.99	1.835	0.20(0.09)	0.43	18.6	352.00
2	35.01	28.76	1.490	0.20(0.09)	0.43	25.0	355.00
3	34.36	31.38	1.417	0.20(0.09)	0.43	25.9	359.00

LONGEST FLOWPATH FROM NODE 359.00 TO NODE 364.00 = 2434.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
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GC10

1	12.53	29.50	1.468	0.20(0.08)	0.40	9.7	348.00
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LONGEST FLOWPATH FROM NODE 348.00 TO NODE 364.00 = 1987.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	43.53	19.99	1.835	0.20(0.08)	0.42	25.2	352.00
2	47.42	28.76	1.490	0.20(0.08)	0.42	34.4	355.00
3	47.36	29.50	1.468	0.20(0.08)	0.42	34.9	348.00
4	46.43	31.38	1.417	0.20(0.08)	0.42	35.6	359.00
TOTAL AREA(ACRES) =			35.6				

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 47.42 Tc(MIN.) = 28.757
 EFFECTIVE AREA(ACRES) = 34.43 AREA-AVERAGED Fm(INCH/HR) = 0.08
 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.42
 TOTAL AREA(ACRES) = 35.6
 LONGEST FLOWPATH FROM NODE 359.00 TO NODE 364.00 = 2434.00 FEET.

 FLOW PROCESS FROM NODE 364.00 TO NODE 364.00 IS CODE = 12

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

 FLOW PROCESS FROM NODE 364.00 TO NODE 368.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 32.50 DOWNSTREAM(FEET) = 32.00
 FLOW LENGTH(FEET) = 483.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 51.0 INCH PIPE IS 38.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 4.12
 ESTIMATED PIPE DIAMETER(INCH) = 51.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 47.42
 PIPE TRAVEL TIME(MIN.) = 1.95 Tc(MIN.) = 30.71
 LONGEST FLOWPATH FROM NODE 359.00 TO NODE 368.00 = 2917.00 FEET.

 FLOW PROCESS FROM NODE 368.00 TO NODE 368.00 IS CODE = 1

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

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION(MIN.) = 30.71
 RAINFALL INTENSITY(INCH/HR) = 1.43
 AREA-AVERAGED Fm(INCH/HR) = 0.08
 AREA-AVERAGED Fp(INCH/HR) = 0.20
 AREA-AVERAGED Ap = 0.42
 EFFECTIVE STREAM AREA(ACRES) = 34.43
 TOTAL STREAM AREA(ACRES) = 35.60
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 47.42

 FLOW PROCESS FROM NODE 365.00 TO NODE 366.00 IS CODE = 21

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

GC10

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 36.00 DOWNSTREAM(FEET) = 35.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.862
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	D	2.00	0.20	0.500	75	12.62
COMMERCIAL	D	0.30	0.20	0.100	75	9.86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.448

SUBAREA RUNOFF(CFS) = 5.51

TOTAL AREA(ACRES) = 2.30 PEAK FLOW RATE(CFS) = 5.51

FLOW PROCESS FROM NODE 366.00 TO NODE 367.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 35.00 DOWNSTREAM ELEVATION(FEET) = 33.00
 STREET LENGTH(FEET) = 765.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 13.84

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.51

HALFSTREET FLOOD WIDTH(FEET) = 20.11

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.73

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.88

STREET FLOW TRAVEL TIME(MIN.) = 7.39 Tc(MIN.) = 17.25

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.996

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	7.10	0.20	0.500	75
COMMERCIAL	D	2.40	0.20	0.100	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.399

SUBAREA AREA(ACRES) = 9.50 SUBAREA RUNOFF(CFS) = 16.39

EFFECTIVE AREA(ACRES) = 11.80 AREA-AVERAGED Fm(INCH/HR) = 0.08

AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.41

TOTAL AREA(ACRES) = 11.8 PEAK FLOW RATE(CFS) = 20.34

END OF SUBAREA STREET FLOW HYDRAULICS:

GC10

DEPTH(FEET) = 0.56 HALFSTREET FLOOD WIDTH(FEET) = 23.16
FLOW VELOCITY(FEET/SEC.) = 1.96 DEPTH*VELOCITY(FT*FT/SEC.) = 1.10
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 765.0 FT WITH ELEVATION-DROP = 2.0 FT, IS 18.4 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 367.00
LONGEST FLOWPATH FROM NODE 365.00 TO NODE 367.00 = 1095.00 FEET.

FLOW PROCESS FROM NODE 367.00 TO NODE 368.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====
UPSTREAM ELEVATION(FEET) = 33.00 DOWNSTREAM ELEVATION(FEET) = 32.00
STREET LENGTH(FEET) = 649.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25.74
STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.65
HALFSTREET FLOOD WIDTH(FEET) = 27.37
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.76
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.14
STREET FLOW TRAVEL TIME(MIN.) = 6.15 Tc(MIN.) = 23.40
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.677

SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Rows include RESIDENTIAL and COMMERCIAL.

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.383
SUBAREA AREA(ACRES) = 7.50 SUBAREA RUNOFF(CFS) = 10.80
EFFECTIVE AREA(ACRES) = 19.30 AREA-AVERAGED Fm(INCH/HR) = 0.08
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.40
TOTAL AREA(ACRES) = 19.3 PEAK FLOW RATE(CFS) = 27.74

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 28.11
FLOW VELOCITY(FEET/SEC.) = 1.80 DEPTH*VELOCITY(FT*FT/SEC.) = 1.19
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 649.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 14.2 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 368.00
LONGEST FLOWPATH FROM NODE 365.00 TO NODE 368.00 = 1744.00 FEET.

FLOW PROCESS FROM NODE 368.00 TO NODE 368.00 IS CODE = 1

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

GC10

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

```

=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 23.40
RAINFALL INTENSITY(INCH/HR) = 1.68
AREA-AVERAGED Fm(INCH/HR) = 0.08
AREA-AVERAGED Fp(INCH/HR) = 0.20
AREA-AVERAGED Ap = 0.40
EFFECTIVE STREAM AREA(ACRES) = 19.30
TOTAL STREAM AREA(ACRES) = 19.30
PEAK FLOW RATE(CFS) AT CONFLUENCE = 27.74
    
```

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	43.53	22.01	1.736	0.20(0.08)	0.42	25.2	352.00
1	47.42	30.71	1.435	0.20(0.08)	0.42	34.4	355.00
1	47.36	31.45	1.415	0.20(0.08)	0.42	34.9	348.00
1	46.43	33.34	1.369	0.20(0.08)	0.42	35.6	359.00
2	27.74	23.40	1.677	0.20(0.08)	0.40	19.3	365.00

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	70.59	22.01	1.736	0.20(0.08)	0.41	43.3	352.00
2	71.89	23.40	1.677	0.20(0.08)	0.41	46.0	365.00
3	70.95	30.71	1.435	0.20(0.08)	0.41	53.7	355.00
4	70.56	31.45	1.415	0.20(0.08)	0.41	54.2	348.00
5	68.82	33.34	1.369	0.20(0.08)	0.41	54.9	359.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

```

PEAK FLOW RATE(CFS) = 71.89 Tc(MIN.) = 23.40
EFFECTIVE AREA(ACRES) = 45.95 AREA-AVERAGED Fm(INCH/HR) = 0.08
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.41
TOTAL AREA(ACRES) = 54.9
LONGEST FLOWPATH FROM NODE 359.00 TO NODE 368.00 = 2917.00 FEET.
    
```

FLOW PROCESS FROM NODE 368.00 TO NODE 374.00 IS CODE = 31

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

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

```

=====
ELEVATION DATA: UPSTREAM(FEET) = 32.00 DOWNSTREAM(FEET) = 31.00
FLOW LENGTH(FEET) = 1208.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 63.0 INCH PIPE IS 46.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.23
ESTIMATED PIPE DIAMETER(INCH) = 63.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 71.89
PIPE TRAVEL TIME(MIN.) = 4.77 Tc(MIN.) = 28.17
LONGEST FLOWPATH FROM NODE 359.00 TO NODE 374.00 = 4125.00 FEET.
    
```

FLOW PROCESS FROM NODE 374.00 TO NODE 374.00 IS CODE = 1

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

GC10

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=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 28.17
RAINFALL INTENSITY(INCH/HR) = 1.51
AREA-AVERAGED Fm(INCH/HR) = 0.08
AREA-AVERAGED Fp(INCH/HR) = 0.20
AREA-AVERAGED Ap = 0.41
EFFECTIVE STREAM AREA(ACRES) = 45.95
TOTAL STREAM AREA(ACRES) = 54.90
PEAK FLOW RATE(CFS) AT CONFLUENCE = 71.89

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*****
FLOW PROCESS FROM NODE 369.00 TO NODE 370.00 IS CODE = 21
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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
-----

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INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 32.50 DOWNSTREAM(FEET) = 32.00

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```

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.329
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.541

```

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	D	0.50	0.20	0.100	75	11.33
URBAN POOR COVER "TURF"	D	0.30	0.20	1.000	87	19.56

```

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.438
SUBAREA RUNOFF(CFS) = 1.77
TOTAL AREA(ACRES) = 0.80 PEAK FLOW RATE(CFS) = 1.77

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*****
FLOW PROCESS FROM NODE 370.00 TO NODE 371.00 IS CODE = 62
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>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 2 USED)<<<<<
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```

UPSTREAM ELEVATION(FEET) = 32.00 DOWNSTREAM ELEVATION(FEET) = 31.80
STREET LENGTH(FEET) = 149.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 42.00

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```

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

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**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.11
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.50
HALFSTREET FLOOD WIDTH(FEET) = 17.10
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.14
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.57

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GC10

STREET FLOW TRAVEL TIME(MIN.) = 2.17 Tc(MIN.) = 13.50
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.297
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	5.20	0.20	0.500	75
COMMERCIAL	D	0.10	0.20	0.100	75
URBAN POOR COVER					
"TURF"	D	0.10	0.20	1.000	87

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.502
 SUBAREA AREA(ACRES) = 5.40 SUBAREA RUNOFF(CFS) = 10.68
 EFFECTIVE AREA(ACRES) = 6.20 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.49
 TOTAL AREA(ACRES) = 6.2 PEAK FLOW RATE(CFS) = 12.27

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 21.29
 FLOW VELOCITY(FEET/SEC.) = 1.30 DEPTH*VELOCITY(FT*FT/SEC.) = 0.76
 LONGEST FLOWPATH FROM NODE 369.00 TO NODE 371.00 = 479.00 FEET.

 FLOW PROCESS FROM NODE 371.00 TO NODE 372.00 IS CODE = 62

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 2 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 31.80 DOWNSTREAM ELEVATION(FEET) = 31.60
 STREET LENGTH(FEET) = 294.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.79
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.75
 HALFSTREET FLOOD WIDTH(FEET) = 34.05
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.13
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.85
 STREET FLOW TRAVEL TIME(MIN.) = 4.35 Tc(MIN.) = 17.85
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.958

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	8.50	0.20	0.500	75
COMMERCIAL	D	1.60	0.20	0.100	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.437
 SUBAREA AREA(ACRES) = 10.10 SUBAREA RUNOFF(CFS) = 17.00
 EFFECTIVE AREA(ACRES) = 16.30 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.46

GC10

TOTAL AREA(ACRES) = 16.3 PEAK FLOW RATE(CFS) = 27.38

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.82 HALFSTREET FLOOD WIDTH(FEET) = 40.29
FLOW VELOCITY(FEET/SEC.) = 1.19 DEPTH*VELOCITY(FT*FT/SEC.) = 0.97

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 294.0 FT WITH ELEVATION-DROP = 0.2 FT, IS 20.8 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 372.00
LONGEST FLOWPATH FROM NODE 369.00 TO NODE 372.00 = 773.00 FEET.

FLOW PROCESS FROM NODE 372.00 TO NODE 373.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 2 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 31.60 DOWNSTREAM ELEVATION(FEET) = 31.40
STREET LENGTH(FEET) = 285.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 34.73

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.87
HALFSTREET FLOOD WIDTH(FEET) = 45.86
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.25
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.09
STREET FLOW TRAVEL TIME(MIN.) = 3.81 Tc(MIN.) = 21.66
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.752

SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Rows include Residential and Commercial categories.

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.427
SUBAREA AREA(ACRES) = 9.80 SUBAREA RUNOFF(CFS) = 14.70
EFFECTIVE AREA(ACRES) = 26.10 AREA-AVERAGED Fm(INCH/HR) = 0.09
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.45
TOTAL AREA(ACRES) = 26.1 PEAK FLOW RATE(CFS) = 39.07

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.90 HALFSTREET FLOOD WIDTH(FEET) = 48.82
FLOW VELOCITY(FEET/SEC.) = 1.27 DEPTH*VELOCITY(FT*FT/SEC.) = 1.15

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 285.0 FT WITH ELEVATION-DROP = 0.2 FT, IS 20.5 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 373.00
LONGEST FLOWPATH FROM NODE 369.00 TO NODE 373.00 = 1058.00 FEET.

FLOW PROCESS FROM NODE 373.00 TO NODE 374.00 IS CODE = 62

GC10

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 2 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 31.40 DOWNSTREAM ELEVATION(FEET) = 31.00
 STREET LENGTH(FEET) = 369.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 53.89
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.93
 HALFSTREET FLOOD WIDTH(FEET) = 51.61
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.61
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.49
 STREET FLOW TRAVEL TIME(MIN.) = 3.82 Tc(MIN.) = 25.48
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.597

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	10.00	0.20	0.500	75
COMMERCIAL	D	11.40	0.20	0.100	75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.287					
SUBAREA AREA(ACRES) = 21.40		SUBAREA RUNOFF(CFS) = 29.65			
EFFECTIVE AREA(ACRES) = 47.50		AREA-AVERAGED Fm(INCH/HR) = 0.07			
AREA-AVERAGED Fp(INCH/HR) = 0.20		AREA-AVERAGED Ap = 0.37			
TOTAL AREA(ACRES) = 47.5		PEAK FLOW RATE(CFS) = 65.06			

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.98 HALFSTREET FLOOD WIDTH(FEET) = 56.86
 FLOW VELOCITY(FEET/SEC.) = 1.66 DEPTH*VELOCITY(FT*FT/SEC.) = 1.63
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 369.0 FT WITH ELEVATION-DROP = 0.4 FT, IS 44.8 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 374.00
 LONGEST FLOWPATH FROM NODE 369.00 TO NODE 374.00 = 1427.00 FEET.

FLOW PROCESS FROM NODE 374.00 TO NODE 374.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 25.48
 RAINFALL INTENSITY(INCH/HR) = 1.60
 AREA-AVERAGED Fm(INCH/HR) = 0.07
 AREA-AVERAGED Fp(INCH/HR) = 0.20
 AREA-AVERAGED Ap = 0.37
 EFFECTIVE STREAM AREA(ACRES) = 47.50

GC10

TOTAL STREAM AREA(ACRES) = 47.50
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 65.06

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	70.59	26.89	1.548	0.20(0.08)	0.41	43.3	352.00
1	71.89	28.17	1.508	0.20(0.08)	0.41	46.0	365.00
1	70.95	35.59	1.319	0.20(0.08)	0.41	53.7	355.00
1	70.56	36.33	1.303	0.20(0.08)	0.41	54.2	348.00
1	68.82	38.22	1.266	0.20(0.08)	0.41	54.9	359.00
2	65.06	25.48	1.597	0.20(0.07)	0.37	47.5	369.00

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	134.17	25.48	1.597	0.20(0.08)	0.39	88.6	369.00
2	133.58	26.89	1.548	0.20(0.08)	0.39	90.8	352.00
3	133.13	28.17	1.508	0.20(0.08)	0.39	93.5	365.00
4	124.12	35.59	1.319	0.20(0.08)	0.39	101.2	355.00
5	123.06	36.33	1.303	0.20(0.08)	0.39	101.7	348.00
6	119.73	38.22	1.266	0.20(0.08)	0.40	102.4	359.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 134.17 Tc(MIN.) = 25.48
 EFFECTIVE AREA(ACRES) = 88.56 AREA-AVERAGED Fm(INCH/HR) = 0.08
 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.39
 TOTAL AREA(ACRES) = 102.4
 LONGEST FLOWPATH FROM NODE 359.00 TO NODE 374.00 = 4125.00 FEET.

FLOW PROCESS FROM NODE 374.00 TO NODE 375.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 31.00 DOWNSTREAM(FEET) = 30.00
 FLOW LENGTH(FEET) = 807.12 MANNING'S N = 0.013
 DEPTH OF FLOW IN 72.0 INCH PIPE IS 55.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 5.69
 ESTIMATED PIPE DIAMETER(INCH) = 72.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 134.17
 PIPE TRAVEL TIME(MIN.) = 2.36 Tc(MIN.) = 27.85
 LONGEST FLOWPATH FROM NODE 359.00 TO NODE 375.00 = 4932.12 FEET.

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 | END OF SYSTEM |
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FLOW PROCESS FROM NODE 376.00 TO NODE 377.00 IS CODE = 21

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

=====

GC10

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 38.00 DOWNSTREAM(FEET) = 37.00

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

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.862

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751

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 URBAN POOR COVER	D	8.50	0.20	0.100	75	9.86
"TURF"	D	0.40	0.20	1.000	87	17.03

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.140

SUBAREA RUNOFF(CFS) = 21.81

TOTAL AREA(ACRES) = 8.90 PEAK FLOW RATE(CFS) = 21.81

FLOW PROCESS FROM NODE 377.00 TO NODE 378.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 3 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 37.00 DOWNSTREAM ELEVATION(FEET) = 36.00

STREET LENGTH(FEET) = 398.00 CURB HEIGHT(INCHES) = 8.0

STREET HALFWIDTH(FEET) = 51.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 25.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0150

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.83

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.70

HALFSTREET FLOOD WIDTH(FEET) = 29.02

AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.09

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.47

STREET FLOW TRAVEL TIME(MIN.) = 3.18 Tc(MIN.) = 13.04

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.344

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL URBAN POOR COVER	D	9.30	0.20	0.100	75
"TURF"	D	0.30	0.20	1.000	87

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.128

SUBAREA AREA(ACRES) = 9.60 SUBAREA RUNOFF(CFS) = 20.03

EFFECTIVE AREA(ACRES) = 18.50 AREA-AVERAGED Fm(INCH/HR) = 0.03

AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.13

TOTAL AREA(ACRES) = 18.5 PEAK FLOW RATE(CFS) = 38.57

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.74 HALFSTREET FLOOD WIDTH(FEET) = 33.12

FLOW VELOCITY(FEET/SEC.) = 2.17 DEPTH*VELOCITY(FT*FT/SEC.) = 1.61

GC10

LONGEST FLOWPATH FROM NODE 376.00 TO NODE 378.00 = 728.00 FEET.

FLOW PROCESS FROM NODE 378.00 TO NODE 379.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 3 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 36.00 DOWNSTREAM ELEVATION(FEET) = 34.00
STREET LENGTH(FEET) = 537.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 51.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 25.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 50.86
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.76
HALFSTREET FLOOD WIDTH(FEET) = 34.88
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.68
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.04
STREET FLOW TRAVEL TIME(MIN.) = 3.34 Tc(MIN.) = 16.39
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.056

SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN
COMMERCIAL D 12.40 0.20 0.100 75
URBAN POOR COVER "TURF" D 1.10 0.20 1.000 87

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.173
SUBAREA AREA(ACRES) = 13.50 SUBAREA RUNOFF(CFS) = 24.56
EFFECTIVE AREA(ACRES) = 32.00 AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.15
TOTAL AREA(ACRES) = 32.0 PEAK FLOW RATE(CFS) = 58.35

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.79 HALFSTREET FLOOD WIDTH(FEET) = 38.01
FLOW VELOCITY(FEET/SEC.) = 2.74 DEPTH*VELOCITY(FT*FT/SEC.) = 2.17
LONGEST FLOWPATH FROM NODE 376.00 TO NODE 379.00 = 1265.00 FEET.

FLOW PROCESS FROM NODE 379.00 TO NODE 380.00 IS CODE = 31

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

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 34.00 DOWNSTREAM(FEET) = 33.00
FLOW LENGTH(FEET) = 236.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 42.0 INCH PIPE IS 32.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 7.34
ESTIMATED PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 58.35
PIPE TRAVEL TIME(MIN.) = 0.54 Tc(MIN.) = 16.92

GC10

LONGEST FLOWPATH FROM NODE 376.00 TO NODE 380.00 = 1501.00 FEET.

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| END OF SYSTEM |
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FLOW PROCESS FROM NODE 381.00 TO NODE 382.00 IS CODE = 21
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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
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INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 38.00 DOWNSTREAM(FEET) = 37.00

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$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 9.862

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751

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.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	D	4.90	0.20	0.500	75	12.62
COMMERCIAL	D	0.60	0.20	0.100	75	9.86
URBAN POOR COVER						
"TURF"	D	1.60	0.20	1.000	87	17.03

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.579

SUBAREA RUNOFF(CFS) = 16.84

TOTAL AREA(ACRES) = 7.10 PEAK FLOW RATE(CFS) = 16.84

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FLOW PROCESS FROM NODE 382.00 TO NODE 383.00 IS CODE = 62
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>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>(STREET TABLE SECTION # 2 USED)<<<<
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UPSTREAM ELEVATION(FEET) = 37.00 DOWNSTREAM ELEVATION(FEET) = 36.50
STREET LENGTH(FEET) = 994.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 42.00

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DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 28.89

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.87

HALFSTREET FLOOD WIDTH(FEET) = 45.37

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.05

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.91

STREET FLOW TRAVEL TIME(MIN.) = 15.73 T_c (MIN.) = 25.59

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.593

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SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	6.80	0.20	0.500	75
APARTMENTS	D	6.10	0.20	0.200	75
COMMERCIAL	D	4.10	0.20	0.100	75
URBAN POOR COVER					
"TURF"	D	0.20	0.20	1.000	87

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.304
SUBAREA AREA(ACRES) = 17.20 SUBAREA RUNOFF(CFS) = 23.71
EFFECTIVE AREA(ACRES) = 24.30 AREA-AVERAGED Fm(INCH/HR) = 0.08
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.38
TOTAL AREA(ACRES) = 24.3 PEAK FLOW RATE(CFS) = 33.15

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.90 HALFSTREET FLOOD WIDTH(FEET) = 48.98
FLOW VELOCITY(FEET/SEC.) = 1.08 DEPTH*VELOCITY(FT*FT/SEC.) = 0.97
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 994.0 FT WITH ELEVATION-DROP = 0.5 FT, IS 26.0 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 383.00
LONGEST FLOWPATH FROM NODE 381.00 TO NODE 383.00 = 1324.00 FEET.

FLOW PROCESS FROM NODE 383.00 TO NODE 383.50 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<<
>>>>(STREET TABLE SECTION # 2 USED)<<<<<<

UPSTREAM ELEVATION(FEET) = 36.50 DOWNSTREAM ELEVATION(FEET) = 36.00
STREET LENGTH(FEET) = 1026.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 40.22
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.96
HALFSTREET FLOOD WIDTH(FEET) = 54.56
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.10
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.05
STREET FLOW TRAVEL TIME(MIN.) = 15.57 Tc(MIN.) = 41.16
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.213

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	0.10	0.25	0.500	69
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	6.00	0.20	0.500	75
APARTMENTS	D	6.80	0.20	0.200	75
COMMERCIAL	D	0.60	0.20	0.100	75

GC10

URBAN POOR COVER

"TURF" D 0.20 0.20 1.000 87
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.341
 SUBAREA AREA(ACRES) = 13.70 SUBAREA RUNOFF(CFS) = 14.11
 EFFECTIVE AREA(ACRES) = 38.00 AREA-AVERAGED Fm(INCH/HR) = 0.07
 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.37
 TOTAL AREA(ACRES) = 38.0 PEAK FLOW RATE(CFS) = 38.96

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.95 HALFSTREET FLOOD WIDTH(FEET) = 53.74
 FLOW VELOCITY(FEET/SEC.) = 1.09 DEPTH*VELOCITY(FT*FT/SEC.) = 1.04
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 1026.0 FT WITH ELEVATION-DROP = 0.5 FT, IS 20.4 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 383.50
 LONGEST FLOWPATH FROM NODE 381.00 TO NODE 383.50 = 2350.00 FEET.

FLOW PROCESS FROM NODE 383.50 TO NODE 384.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 36.00 DOWNSTREAM(FEET) = 35.50
 FLOW LENGTH(FEET) = 87.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 24.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 7.56
 ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 38.96
 PIPE TRAVEL TIME(MIN.) = 0.19 Tc(MIN.) = 41.35
 LONGEST FLOWPATH FROM NODE 381.00 TO NODE 384.00 = 2437.00 FEET.

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 | END OF SYSTEM |
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FLOW PROCESS FROM NODE 385.00 TO NODE 386.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 37.00 DOWNSTREAM(FEET) = 36.50

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.329

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.541

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.)
APARTMENTS	D	4.40	0.20	0.200	75	12.07
COMMERCIAL	D	0.80	0.20	0.100	75	11.33

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.185

SUBAREA RUNOFF(CFS) = 11.72

TOTAL AREA(ACRES) = 5.20 PEAK FLOW RATE(CFS) = 11.72

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FLOW PROCESS FROM NODE 386.00 TO NODE 387.00 IS CODE = 62

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 2 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 36.50 DOWNSTREAM ELEVATION(FEET) = 36.00
 STREET LENGTH(FEET) = 284.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.13
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.61
 HALFSTREET FLOOD WIDTH(FEET) = 22.44
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.54
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.94
 STREET FLOW TRAVEL TIME(MIN.) = 3.06 Tc(MIN.) = 14.39
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.215

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
APARTMENTS	D	3.80	0.20	0.200	75
COMMERCIAL	D	0.70	0.20	0.100	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.184
 SUBAREA AREA(ACRES) = 4.50 SUBAREA RUNOFF(CFS) = 8.82
 EFFECTIVE AREA(ACRES) = 9.70 AREA-AVERAGED Fm(INCH/HR) = 0.04
 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.18
 TOTAL AREA(ACRES) = 9.7 PEAK FLOW RATE(CFS) = 19.01

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 23.91
 FLOW VELOCITY(FEET/SEC.) = 1.61 DEPTH*VELOCITY(FT*FT/SEC.) = 1.02
 LONGEST FLOWPATH FROM NODE 385.00 TO NODE 387.00 = 614.00 FEET.

FLOW PROCESS FROM NODE 387.00 TO NODE 388.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 36.00 DOWNSTREAM(FEET) = 35.50
 FLOW LENGTH(FEET) = 432.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 26.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 3.44
 ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 19.01
 PIPE TRAVEL TIME(MIN.) = 2.09 Tc(MIN.) = 16.49
 LONGEST FLOWPATH FROM NODE 385.00 TO NODE 388.00 = 1046.00 FEET.

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FLOW PROCESS FROM NODE 388.00 TO NODE 388.00 IS CODE = 81

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

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=====
MAINLINE Tc(MIN.) = 16.49
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.049
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
    LAND USE         GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
APARTMENTS           D       5.50   0.20   0.200  75
COMMERCIAL           D       1.40   0.20   0.100  75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.180
SUBAREA AREA(ACRES) = 6.90      SUBAREA RUNOFF(CFS) = 12.50
EFFECTIVE AREA(ACRES) = 16.60   AREA-AVERAGED Fm(INCH/HR) = 0.04
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.18
TOTAL AREA(ACRES) = 16.6      PEAK FLOW RATE(CFS) = 30.07

```

FLOW PROCESS FROM NODE 388.00 TO NODE 389.00 IS CODE = 31

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

```

=====
ELEVATION DATA: UPSTREAM(FEET) = 35.50 DOWNSTREAM(FEET) = 34.00
FLOW LENGTH(FEET) = 1763.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 45.0 INCH PIPE IS 33.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 3.43
ESTIMATED PIPE DIAMETER(INCH) = 45.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 30.07
PIPE TRAVEL TIME(MIN.) = 8.57 Tc(MIN.) = 25.06
LONGEST FLOWPATH FROM NODE 385.00 TO NODE 389.00 = 2809.00 FEET.

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FLOW PROCESS FROM NODE 389.00 TO NODE 389.00 IS CODE = 81

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

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=====
MAINLINE Tc(MIN.) = 25.06
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.612
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
    LAND USE         GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"5-7 DWELLINGS/ACRE" C       2.30   0.25   0.500  69
RESIDENTIAL
"5-7 DWELLINGS/ACRE" D      16.70   0.20   0.500  75
APARTMENTS           D      25.60   0.20   0.200  75
COMMERCIAL           C       0.20   0.25   0.100  69
COMMERCIAL           D      10.90   0.20   0.100  75
URBAN POOR COVER
"TURF"               D       0.70   0.20   1.000  87
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.291
SUBAREA AREA(ACRES) = 56.40     SUBAREA RUNOFF(CFS) = 78.82
EFFECTIVE AREA(ACRES) = 73.00   AREA-AVERAGED Fm(INCH/HR) = 0.05
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.27
TOTAL AREA(ACRES) = 73.0      PEAK FLOW RATE(CFS) = 102.35

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END OF SYSTEM

FLOW PROCESS FROM NODE 390.00 TO NODE 391.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 35.00 DOWNSTREAM(FEET) = 34.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.862
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751
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.)
APARTMENTS	C	0.10	0.25	0.200	69	10.51
APARTMENTS	D	3.00	0.20	0.200	75	10.51
COMMERCIAL	D	0.20	0.20	0.100	75	9.86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.194
SUBAREA RUNOFF(CFS) = 8.05
TOTAL AREA(ACRES) = 3.30 PEAK FLOW RATE(CFS) = 8.05

FLOW PROCESS FROM NODE 391.00 TO NODE 392.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 34.00 DOWNSTREAM ELEVATION(FEET) = 33.50
STREET LENGTH(FEET) = 595.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 15.73
STREET FLOWING FULL
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.61
HALFSTREET FLOOD WIDTH(FEET) = 25.66
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.23
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.75
STREET FLOW TRAVEL TIME(MIN.) = 8.08 Tc(MIN.) = 17.94
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.952

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
APARTMENTS	D	8.60	0.20	0.200	75

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COMMERCIAL D 0.20 0.20 0.100 75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.198
 SUBAREA AREA(ACRES) = 8.80 SUBAREA RUNOFF(CFS) = 15.15
 EFFECTIVE AREA(ACRES) = 12.10 AREA-AVERAGED Fm(INCH/HR) = 0.04
 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.20
 TOTAL AREA(ACRES) = 12.1 PEAK FLOW RATE(CFS) = 20.83

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.67 HALFSTREET FLOOD WIDTH(FEET) = 28.29
 FLOW VELOCITY(FEET/SEC.) = 1.33 DEPTH*VELOCITY(FT*FT/SEC.) = 0.89
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 595.0 FT WITH ELEVATION-DROP = 0.5 FT, IS 16.1 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 392.00
 LONGEST FLOWPATH FROM NODE 390.00 TO NODE 392.00 = 925.00 FEET.

FLOW PROCESS FROM NODE 392.00 TO NODE 393.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<<

UPSTREAM ELEVATION(FEET) = 33.50 DOWNSTREAM ELEVATION(FEET) = 33.00
 STREET LENGTH(FEET) = 723.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 32.42

STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.79

HALFSTREET FLOOD WIDTH(FEET) = 34.45

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.39

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.09

STREET FLOW TRAVEL TIME(MIN.) = 8.69 Tc(MIN.) = 26.63

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.557

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
APARTMENTS	D	16.20	0.20	0.200	75
COMMERCIAL	D	0.70	0.20	0.100	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.196

SUBAREA AREA(ACRES) = 16.90 SUBAREA RUNOFF(CFS) = 23.08

EFFECTIVE AREA(ACRES) = 29.00 AREA-AVERAGED Fm(INCH/HR) = 0.04

AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.20

TOTAL AREA(ACRES) = 29.0 PEAK FLOW RATE(CFS) = 39.60

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.84 HALFSTREET FLOOD WIDTH(FEET) = 37.20
 FLOW VELOCITY(FEET/SEC.) = 1.45 DEPTH*VELOCITY(FT*FT/SEC.) = 1.22
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

GC10

AND L = 723.0 FT WITH ELEVATION-DROP = 0.5 FT, IS 28.9 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 393.00
 LONGEST FLOWPATH FROM NODE 390.00 TO NODE 393.00 = 1648.00 FEET.

FLOW PROCESS FROM NODE 393.00 TO NODE 397.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 33.00 DOWNSTREAM(FEET) = 32.50
 FLOW LENGTH(FEET) = 1865.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 60.0 INCH PIPE IS 48.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 2.35
 ESTIMATED PIPE DIAMETER(INCH) = 60.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 39.60
 PIPE TRAVEL TIME(MIN.) = 13.24 Tc(MIN.) = 39.87
 LONGEST FLOWPATH FROM NODE 390.00 TO NODE 397.00 = 3513.00 FEET.

FLOW PROCESS FROM NODE 397.00 TO NODE 397.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION(MIN.) = 39.87
 RAINFALL INTENSITY(INCH/HR) = 1.24
 AREA-AVERAGED Fm(INCH/HR) = 0.04
 AREA-AVERAGED Fp(INCH/HR) = 0.20
 AREA-AVERAGED Ap = 0.20
 EFFECTIVE STREAM AREA(ACRES) = 29.00
 TOTAL STREAM AREA(ACRES) = 29.00
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 39.60

FLOW PROCESS FROM NODE 394.00 TO NODE 395.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 36.50 DOWNSTREAM(FEET) = 36.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.329
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.541

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.)
APARTMENTS	D	0.10	0.20	0.200	75	12.07
COMMERCIAL	D	7.30	0.20	0.100	75	11.33
URBAN POOR COVER "TURF"	D	0.10	0.20	1.000	87	19.56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.113
 SUBAREA RUNOFF(CFS) = 17.00
 TOTAL AREA(ACRES) = 7.50 PEAK FLOW RATE(CFS) = 17.00

GC10

FLOW PROCESS FROM NODE 395.00 TO NODE 396.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 2 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 36.00 DOWNSTREAM ELEVATION(FEET) = 35.00
STREET LENGTH(FEET) = 675.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 43.74
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.84
HALFSTREET FLOOD WIDTH(FEET) = 42.26
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.77
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.48
STREET FLOW TRAVEL TIME(MIN.) = 6.35 Tc(MIN.) = 17.68
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.969

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
APARTMENTS	D	8.80	0.20	0.200	75
COMMERCIAL	D	20.80	0.20	0.100	75
URBAN POOR COVER "TURF"	D	0.90	0.20	1.000	87

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.155
SUBAREA AREA(ACRES) = 30.50 SUBAREA RUNOFF(CFS) = 53.19
EFFECTIVE AREA(ACRES) = 38.00 AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.15
TOTAL AREA(ACRES) = 38.0 PEAK FLOW RATE(CFS) = 66.32

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.94 HALFSTREET FLOOD WIDTH(FEET) = 53.08
FLOW VELOCITY(FEET/SEC.) = 1.89 DEPTH*VELOCITY(FT*FT/SEC.) = 1.79
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 675.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 58.2 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 396.00
LONGEST FLOWPATH FROM NODE 394.00 TO NODE 396.00 = 1005.00 FEET.

FLOW PROCESS FROM NODE 396.00 TO NODE 397.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 35.00 DOWNSTREAM(FEET) = 32.50
FLOW LENGTH(FEET) = 1110.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 51.0 INCH PIPE IS 36.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.04
ESTIMATED PIPE DIAMETER(INCH) = 51.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 66.32

GC10

PIPE TRAVEL TIME(MIN.) = 3.06 Tc(MIN.) = 20.74
 LONGEST FLOWPATH FROM NODE 394.00 TO NODE 397.00 = 2115.00 FEET.

 FLOW PROCESS FROM NODE 397.00 TO NODE 397.00 IS CODE = 81

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

=====

MAINLINE Tc(MIN.) = 20.74
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.796
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
APARTMENTS	D	4.90	0.20	0.200	75
COMMERCIAL	D	59.20	0.20	0.100	75
URBAN POOR COVER "TURF"	D	1.30	0.20	1.000	87

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.125
 SUBAREA AREA(ACRES) = 65.40 SUBAREA RUNOFF(CFS) = 104.26
 EFFECTIVE AREA(ACRES) = 103.40 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.13
 TOTAL AREA(ACRES) = 103.4 PEAK FLOW RATE(CFS) = 164.69

 FLOW PROCESS FROM NODE 397.00 TO NODE 397.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 20.74
 RAINFALL INTENSITY(INCH/HR) = 1.80
 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.20
 AREA-AVERAGED Ap = 0.13
 EFFECTIVE STREAM AREA(ACRES) = 103.40
 TOTAL STREAM AREA(ACRES) = 103.40
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 164.69

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	39.60	39.87	1.235	0.20(0.04)	0.20	29.0	390.00
2	164.69	20.74	1.796	0.20(0.03)	0.13	103.4	394.00

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	194.96	20.74	1.796	0.20(0.03)	0.14	118.5	394.00
2	152.09	39.87	1.235	0.20(0.03)	0.15	132.4	390.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 194.96 Tc(MIN.) = 20.74
 EFFECTIVE AREA(ACRES) = 118.49 AREA-AVERAGED Fm(INCH/HR) = 0.03
 AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.14

GC10

TOTAL AREA(ACRES) = 132.4
LONGEST FLOWPATH FROM NODE 390.00 TO NODE 397.00 = 3513.00 FEET.

FLOW PROCESS FROM NODE 397.00 TO NODE 398.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 32.50 DOWNSTREAM(FEET) = 32.00
FLOW LENGTH(FEET) = 1915.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 114.0 INCH PIPE IS 83.1 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 3.52
ESTIMATED PIPE DIAMETER(INCH) = 114.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 194.96
PIPE TRAVEL TIME(MIN.) = 9.07 Tc(MIN.) = 29.81
LONGEST FLOWPATH FROM NODE 390.00 TO NODE 398.00 = 5428.00 FEET.

+-----+
| END OF SYSTEM |
+-----+

FLOW PROCESS FROM NODE 399.10 TO NODE 399.20 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 110.00 DOWNSTREAM(FEET) = 108.00

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.586

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	B	2.60	0.30	0.500	56	10.99
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	3.60	0.25	0.500	69	10.99
NATURAL FAIR COVER						
"OPEN BRUSH"	C	0.90	0.25	1.000	77	19.94
COMMERCIAL	B	0.80	0.30	0.100	56	8.59
COMMERCIAL	C	1.40	0.25	0.100	69	8.59

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.454

SUBAREA RUNOFF(CFS) = 23.91

TOTAL AREA(ACRES) = 9.30 PEAK FLOW RATE(CFS) = 23.91

FLOW PROCESS FROM NODE 399.20 TO NODE 399.30 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 3 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 108.00 DOWNSTREAM ELEVATION(FEET) = 105.00
STREET LENGTH(FEET) = 510.00 CURB HEIGHT(INCHES) = 8.0

GC10

STREET HALFWIDTH(FEET) = 51.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 25.00

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) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0150

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 40.31

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.81

HALFSTREET FLOOD WIDTH(FEET) = 40.15

AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.51

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.86

STREET FLOW TRAVEL TIME(MIN.) = 2.42 Tc(MIN.) = 11.01

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.583

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	4.30	0.30	0.500	56
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	5.90	0.25	0.500	69
NATURAL FAIR COVER					
"OPEN BRUSH"	C	1.50	0.25	1.000	77
COMMERCIAL	B	1.10	0.30	0.100	56
COMMERCIAL	C	2.00	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.467

SUBAREA AREA(ACRES) = 14.80 SUBAREA RUNOFF(CFS) = 32.75

EFFECTIVE AREA(ACRES) = 24.10 AREA-AVERAGED Fm(INCH/HR) = 0.12

AREA-AVERAGED Fp(INCH/HR) = 0.27 AREA-AVERAGED Ap = 0.46

TOTAL AREA(ACRES) = 24.1 PEAK FLOW RATE(CFS) = 53.35

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.88 HALFSTREET FLOOD WIDTH(FEET) = 46.99

FLOW VELOCITY(FEET/SEC.) = 3.69 DEPTH*VELOCITY(FT*FT/SEC.) = 3.26

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 510.0 FT WITH ELEVATION-DROP = 3.0 FT, IS 34.1 CFS,

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 399.30

LONGEST FLOWPATH FROM NODE 399.10 TO NODE 399.30 = 840.00 FEET.

FLOW PROCESS FROM NODE 399.30 TO NODE 399.40 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 3 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 105.00 DOWNSTREAM ELEVATION(FEET) = 104.00

STREET LENGTH(FEET) = 698.00 CURB HEIGHT(INCHES) = 8.0

STREET HALFWIDTH(FEET) = 51.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 25.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

GC10

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0150

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 69.95
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.96
HALFSTREET FLOOD WIDTH(FEET) = 54.61
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.91
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.83
STREET FLOW TRAVEL TIME(MIN.) = 6.10 Tc(MIN.) = 17.10
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.006

SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN
RESIDENTIAL
"5-7 DWELLINGS/ACRE" B 1.30 0.30 0.500 56
COMMERCIAL B 0.90 0.30 0.100 56
RESIDENTIAL
"5-7 DWELLINGS/ACRE" C 8.60 0.25 0.500 69
COMMERCIAL C 3.90 0.25 0.100 69
NATURAL FAIR COVER
"OPEN BRUSH" C 1.10 0.25 1.000 77
COMMERCIAL C 3.40 0.25 0.100 69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.358
SUBAREA AREA(ACRES) = 19.20 SUBAREA RUNOFF(CFS) = 33.09
EFFECTIVE AREA(ACRES) = 43.30 AREA-AVERAGED Fm(INCH/HR) = 0.11
AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.42
TOTAL AREA(ACRES) = 43.3 PEAK FLOW RATE(CFS) = 73.94

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.97 HALFSTREET FLOOD WIDTH(FEET) = 55.97
FLOW VELOCITY(FEET/SEC.) = 1.94 DEPTH*VELOCITY(FT*FT/SEC.) = 1.88
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 698.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 35.2 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 399.40
LONGEST FLOWPATH FROM NODE 399.10 TO NODE 399.40 = 1538.00 FEET.

FLOW PROCESS FROM NODE 399.40 TO NODE 399.80 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 104.00 DOWNSTREAM(FEET) = 100.00
FLOW LENGTH(FEET) = 653.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 42.0 INCH PIPE IS 34.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 8.85
ESTIMATED PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 73.94
PIPE TRAVEL TIME(MIN.) = 1.23 Tc(MIN.) = 18.33
LONGEST FLOWPATH FROM NODE 399.10 TO NODE 399.80 = 2191.00 FEET.

FLOW PROCESS FROM NODE 399.80 TO NODE 399.80 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
=====
TOTAL NUMBER OF STREAMS = 2

GC10

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 18.33
RAINFALL INTENSITY(INCH/HR) = 1.93
AREA-AVERAGED Fm(INCH/HR) = 0.11
AREA-AVERAGED Fp(INCH/HR) = 0.26
AREA-AVERAGED Ap = 0.42
EFFECTIVE STREAM AREA(ACRES) = 43.30
TOTAL STREAM AREA(ACRES) = 43.30
PEAK FLOW RATE(CFS) AT CONFLUENCE = 73.94

FLOW PROCESS FROM NODE 399.50 TO NODE 399.60 IS CODE = 21

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 246.00
ELEVATION DATA: UPSTREAM(FEET) = 108.00 DOWNSTREAM(FEET) = 107.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.269
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.043

SUBAREA Tc AND LOSS RATE DATA(AMC II):

Table with 7 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN, Tc (MIN.). Rows include RESIDENTIAL and COMMERCIAL categories.

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.144
SUBAREA RUNOFF(CFS) = 2.44
TOTAL AREA(ACRES) = 0.90 PEAK FLOW RATE(CFS) = 2.44

FLOW PROCESS FROM NODE 399.60 TO NODE 399.70 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 107.00 DOWNSTREAM ELEVATION(FEET) = 102.00
STREET LENGTH(FEET) = 775.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.16
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.41
HALFSTREET FLOOD WIDTH(FEET) = 14.49
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.26
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.92
STREET FLOW TRAVEL TIME(MIN.) = 5.71 Tc(MIN.) = 13.98
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.252

GC10

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	6.40	0.25	0.500	69
COMMERCIAL	C	1.50	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.424
 SUBAREA AREA(ACRES) = 7.90 SUBAREA RUNOFF(CFS) = 15.26
 EFFECTIVE AREA(ACRES) = 8.80 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.40
 TOTAL AREA(ACRES) = 8.8 PEAK FLOW RATE(CFS) = 17.05

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.47 HALFSTREET FLOOD WIDTH(FEET) = 17.85
 FLOW VELOCITY(FEET/SEC.) = 2.56 DEPTH*VELOCITY(FT*FT/SEC.) = 1.21
 LONGEST FLOWPATH FROM NODE 399.50 TO NODE 399.70 = 1021.00 FEET.

FLOW PROCESS FROM NODE 399.70 TO NODE 399.80 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 102.00 DOWNSTREAM ELEVATION(FEET) = 100.00
 STREET LENGTH(FEET) = 672.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 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) = 0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 23.97
 STREET FLOWING FULL

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.58
 HALFSTREET FLOOD WIDTH(FEET) = 23.89
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.17
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.25
 STREET FLOW TRAVEL TIME(MIN.) = 5.17 Tc(MIN.) = 19.15
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.881

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	2.40	0.25	0.500	69
COMMERCIAL	C	6.00	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.214
 SUBAREA AREA(ACRES) = 8.40 SUBAREA RUNOFF(CFS) = 13.81
 EFFECTIVE AREA(ACRES) = 17.20 AREA-AVERAGED Fm(INCH/HR) = 0.08
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.31
 TOTAL AREA(ACRES) = 17.2 PEAK FLOW RATE(CFS) = 27.92

END OF SUBAREA STREET FLOW HYDRAULICS:

GC10

DEPTH(FEET) = 0.60 HALFSTREET FLOOD WIDTH(FEET) = 25.18
FLOW VELOCITY(FEET/SEC.) = 2.27 DEPTH*VELOCITY(FT*FT/SEC.) = 1.37
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 672.0 FT WITH ELEVATION-DROP = 2.0 FT, IS 17.2 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 399.80
LONGEST FLOWPATH FROM NODE 399.50 TO NODE 399.80 = 1693.00 FEET.

FLOW PROCESS FROM NODE 399.80 TO NODE 399.80 IS CODE = 1

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

=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 19.15
RAINFALL INTENSITY(INCH/HR) = 1.88
AREA-AVERAGED Fm(INCH/HR) = 0.08
AREA-AVERAGED Fp(INCH/HR) = 0.25
AREA-AVERAGED Ap = 0.31
EFFECTIVE STREAM AREA(ACRES) = 17.20
TOTAL STREAM AREA(ACRES) = 17.20
PEAK FLOW RATE(CFS) AT CONFLUENCE = 27.92

** CONFLUENCE DATA **

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 1 and 2.

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

** PEAK FLOW RATE TABLE **

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 1 and 2.

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 101.38 Tc(MIN.) = 18.33
EFFECTIVE AREA(ACRES) = 59.77 AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.39
TOTAL AREA(ACRES) = 60.5
LONGEST FLOWPATH FROM NODE 399.10 TO NODE 399.80 = 2191.00 FEET.

FLOW PROCESS FROM NODE 399.80 TO NODE 400.10 IS CODE = 31

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

=====
ELEVATION DATA: UPSTREAM(FEET) = 100.00 DOWNSTREAM(FEET) = 98.00
FLOW LENGTH(FEET) = 310.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 48.0 INCH PIPE IS 36.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 9.89
ESTIMATED PIPE DIAMETER(INCH) = 48.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 101.38
PIPE TRAVEL TIME(MIN.) = 0.52 Tc(MIN.) = 18.86
LONGEST FLOWPATH FROM NODE 399.10 TO NODE 400.10 = 2501.00 FEET.

GC10

 FLOW PROCESS FROM NODE 400.10 TO NODE 400.10 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION(MIN.) = 18.86
 RAINFALL INTENSITY(INCH/HR) = 1.90
 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.26
 AREA-AVERAGED Ap = 0.39
 EFFECTIVE STREAM AREA(ACRES) = 59.77
 TOTAL STREAM AREA(ACRES) = 60.50
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 101.38

 FLOW PROCESS FROM NODE 399.90 TO NODE 400.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 104.00 DOWNSTREAM(FEET) = 102.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.586
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	1.30	0.25	0.500	69	10.99
COMMERCIAL	C	0.30	0.25	0.100	69	8.59

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.425

SUBAREA RUNOFF(CFS) = 4.14

TOTAL AREA(ACRES) = 1.60 PEAK FLOW RATE(CFS) = 4.14

 FLOW PROCESS FROM NODE 400.00 TO NODE 400.10 IS CODE = 62

 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 102.00 DOWNSTREAM ELEVATION(FEET) = 98.00
 STREET LENGTH(FEET) = 970.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

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) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.43

GC10

STREET FLOW SPLITS OVER STREET-CROWN

FULL DEPTH(FEET) = 0.52 FLOOD WIDTH(FEET) = 20.81
 FULL HALF-STREET VELOCITY(FEET/SEC.) = 2.19
 SPLIT DEPTH(FEET) = 0.30 SPLIT FLOOD WIDTH(FEET) = 9.03
 SPLIT FLOW(CFS) = 1.35 SPLIT VELOCITY(FEET/SEC.) = 1.40

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.52
 HALFSTREET FLOOD WIDTH(FEET) = 20.81
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.19
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.13
 STREET FLOW TRAVEL TIME(MIN.) = 7.39 Tc(MIN.) = 15.98
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.086

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	4.30	0.25	0.500	69
COMMERCIAL	C	2.70	0.25	0.100	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.346
 SUBAREA AREA(ACRES) = 7.00 SUBAREA RUNOFF(CFS) = 12.60
 EFFECTIVE AREA(ACRES) = 8.60 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.36
 TOTAL AREA(ACRES) = 8.6 PEAK FLOW RATE(CFS) = 15.45

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.52 HALFSTREET FLOOD WIDTH(FEET) = 20.81
 FLOW VELOCITY(FEET/SEC.) = 2.19 DEPTH*VELOCITY(FT*FT/SEC.) = 1.13
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 970.0 FT WITH ELEVATION-DROP = 4.0 FT, IS 13.5 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 400.10
 LONGEST FLOWPATH FROM NODE 399.90 TO NODE 400.10 = 1300.00 FEET.

FLOW PROCESS FROM NODE 400.10 TO NODE 400.10 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 15.98
 RAINFALL INTENSITY(INCH/HR) = 2.09
 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.36
 EFFECTIVE STREAM AREA(ACRES) = 8.60
 TOTAL STREAM AREA(ACRES) = 8.60
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 15.45

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	101.38	18.86	1.897	0.26(0.10)	0.39	59.8	399.10
1	99.93	19.67	1.852	0.26(0.10)	0.38	60.5	399.50
2	15.45	15.98	2.086	0.25(0.09)	0.36	8.6	399.90

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

GC10

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	110.39	15.98	2.086	0.26(0.10)	0.38	59.2	399.90
2	115.37	18.86	1.897	0.26(0.10)	0.38	68.4	399.10
3	113.57	19.67	1.852	0.26(0.10)	0.38	69.1	399.50

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 115.37 Tc(MIN.) = 18.86
 EFFECTIVE AREA(ACRES) = 68.37 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.38
 TOTAL AREA(ACRES) = 69.1
 LONGEST FLOWPATH FROM NODE 399.10 TO NODE 400.10 = 2501.00 FEET.

FLOW PROCESS FROM NODE 400.10 TO NODE 400.40 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 98.00 DOWNSTREAM(FEET) = 97.00
 FLOW LENGTH(FEET) = 315.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 57.0 INCH PIPE IS 44.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 7.80
 ESTIMATED PIPE DIAMETER(INCH) = 57.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 115.37
 PIPE TRAVEL TIME(MIN.) = 0.67 Tc(MIN.) = 19.53
 LONGEST FLOWPATH FROM NODE 399.10 TO NODE 400.40 = 2816.00 FEET.

FLOW PROCESS FROM NODE 400.40 TO NODE 400.40 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION(MIN.) = 19.53
 RAINFALL INTENSITY(INCH/HR) = 1.86
 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.26
 AREA-AVERAGED Ap = 0.38
 EFFECTIVE STREAM AREA(ACRES) = 68.37
 TOTAL STREAM AREA(ACRES) = 69.10
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 115.37

FLOW PROCESS FROM NODE 400.20 TO NODE 400.30 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 272.00
 ELEVATION DATA: UPSTREAM(FEET) = 104.00 DOWNSTREAM(FEET) = 102.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.646
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.183

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
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GC10

RESIDENTIAL

"5-7 DWELLINGS/ACRE" C 0.60 0.25 0.500 69 9.78
 COMMERCIAL C 0.30 0.25 0.100 69 7.65
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.367
 SUBAREA RUNOFF(CFS) = 2.50
 TOTAL AREA(ACRES) = 0.90 PEAK FLOW RATE(CFS) = 2.50

FLOW PROCESS FROM NODE 400.30 TO NODE 400.40 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<<

UPSTREAM ELEVATION(FEET) = 102.00 DOWNSTREAM ELEVATION(FEET) = 97.00
 STREET LENGTH(FEET) = 1199.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 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) = 0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.45

STREET FLOW SPLITS OVER STREET-CROWN

FULL DEPTH(FEET) = 0.52 FLOOD WIDTH(FEET) = 20.81
 FULL HALF-STREET VELOCITY(FEET/SEC.) = 2.20
 SPLIT DEPTH(FEET) = 0.19 SPLIT FLOOD WIDTH(FEET) = 3.72
 SPLIT FLOW(CFS) = 0.32 SPLIT VELOCITY(FEET/SEC.) = 1.12

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.52
 HALFSTREET FLOOD WIDTH(FEET) = 20.81
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.20
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.14
 STREET FLOW TRAVEL TIME(MIN.) = 9.09 Tc(MIN.) = 16.73

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.032

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	2.10	0.25	0.500	69
COMMERCIAL	C	5.70	0.25	0.100	69
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.208					
SUBAREA AREA(ACRES) = 7.80		SUBAREA RUNOFF(CFS) = 13.90			
EFFECTIVE AREA(ACRES) = 8.70		AREA-AVERAGED Fm(INCH/HR) = 0.06			
AREA-AVERAGED Fp(INCH/HR) = 0.25		AREA-AVERAGED Ap = 0.22			
TOTAL AREA(ACRES) = 8.7		PEAK FLOW RATE(CFS) = 15.47			

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.52 HALFSTREET FLOOD WIDTH(FEET) = 20.81
 FLOW VELOCITY(FEET/SEC.) = 2.20 DEPTH*VELOCITY(FT*FT/SEC.) = 1.14

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 1199.0 FT WITH ELEVATION-DROP = 5.0 FT, IS 14.5 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 400.40

LONGEST FLOWPATH FROM NODE 400.20 TO NODE 400.40 = 1471.00 FEET.

GC10

 FLOW PROCESS FROM NODE 400.40 TO NODE 400.40 IS CODE = 81

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

=====

MAINLINE Tc(MIN.) = 16.73
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.032
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	1.00	0.25	0.100	69
NATURAL FAIR COVER "OPEN BRUSH"	C	0.30	0.25	1.000	77
SCHOOL	C	0.40	0.25	0.600	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.376
 SUBAREA AREA(ACRES) = 1.70 SUBAREA RUNOFF(CFS) = 2.96
 EFFECTIVE AREA(ACRES) = 10.40 AREA-AVERAGED Fm(INCH/HR) = 0.06
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.25
 TOTAL AREA(ACRES) = 10.4 PEAK FLOW RATE(CFS) = 18.43

 FLOW PROCESS FROM NODE 400.40 TO NODE 400.40 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 16.73
 RAINFALL INTENSITY(INCH/HR) = 2.03
 AREA-AVERAGED Fm(INCH/HR) = 0.06
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.25
 EFFECTIVE STREAM AREA(ACRES) = 10.40
 TOTAL STREAM AREA(ACRES) = 10.40
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 18.43

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	110.39	16.66	2.037	0.26(0.10)	0.38	59.2	399.90
1	115.37	19.53	1.860	0.26(0.10)	0.38	68.4	399.10
1	113.57	20.35	1.816	0.26(0.10)	0.38	69.1	399.50
2	18.43	16.73	2.032	0.25(0.06)	0.25	10.4	400.20

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	128.78	16.66	2.037	0.26(0.09)	0.36	69.6	399.90
2	128.96	16.73	2.032	0.26(0.09)	0.36	69.9	400.20
3	132.19	19.53	1.860	0.26(0.09)	0.36	78.8	399.10
4	129.99	20.35	1.816	0.26(0.09)	0.36	79.5	399.50

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) = 132.19 Tc(MIN.) = 19.53

GC10

EFFECTIVE AREA(ACRES) = 78.77 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.36
 TOTAL AREA(ACRES) = 79.5
 LONGEST FLOWPATH FROM NODE 399.10 TO NODE 400.40 = 2816.00 FEET.

 FLOW PROCESS FROM NODE 400.40 TO NODE 401.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 97.00 DOWNSTREAM(FEET) = 94.00
 FLOW LENGTH(FEET) = 476.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 54.0 INCH PIPE IS 39.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 10.53
 ESTIMATED PIPE DIAMETER(INCH) = 54.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 132.19
 PIPE TRAVEL TIME(MIN.) = 0.75 Tc(MIN.) = 20.28
 LONGEST FLOWPATH FROM NODE 399.10 TO NODE 401.00 = 3292.00 FEET.

 FLOW PROCESS FROM NODE 401.00 TO NODE 401.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION(MIN.) = 20.28
 RAINFALL INTENSITY(INCH/HR) = 1.82
 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.26
 AREA-AVERAGED Ap = 0.36
 EFFECTIVE STREAM AREA(ACRES) = 78.77
 TOTAL STREAM AREA(ACRES) = 79.50
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 132.19

 FLOW PROCESS FROM NODE 401.10 TO NODE 401.20 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 327.00
 ELEVATION DATA: UPSTREAM(FEET) = 103.00 DOWNSTREAM(FEET) = 101.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.539
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.987
 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	C	1.40	0.25	0.100	69	8.54

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 3.73
 TOTAL AREA(ACRES) = 1.40 PEAK FLOW RATE(CFS) = 3.73

 FLOW PROCESS FROM NODE 401.20 TO NODE 401.00 IS CODE = 62

GC10

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<<

UPSTREAM ELEVATION(FEET) = 101.00 DOWNSTREAM ELEVATION(FEET) = 94.00
STREET LENGTH(FEET) = 1286.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
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) = 0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14.35
STREET FLOW SPLITS OVER STREET-CROWN

FULL DEPTH(FEET) = 0.52 FLOOD WIDTH(FEET) = 20.81
FULL HALF-STREET VELOCITY(FEET/SEC.) = 2.51
SPLIT DEPTH(FEET) = 0.39 SPLIT FLOOD WIDTH(FEET) = 13.48
SPLIT FLOW(CFS) = 3.91 SPLIT VELOCITY(FEET/SEC.) = 1.99

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.52
HALFSTREET FLOOD WIDTH(FEET) = 20.81
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.51
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.30
STREET FLOW TRAVEL TIME(MIN.) = 8.53 Tc(MIN.) = 17.07

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.009

SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Rows include Residential (5-7 Dwellings/Acre), Commercial, and Natural Fair Cover (Open Brush).

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.302
SUBAREA AREA(ACRES) = 12.20 SUBAREA RUNOFF(CFS) = 21.23
EFFECTIVE AREA(ACRES) = 13.60 AREA-AVERAGED Fm(INCH/HR) = 0.07
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.28
TOTAL AREA(ACRES) = 13.6 PEAK FLOW RATE(CFS) = 23.73

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.53 HALFSTREET FLOOD WIDTH(FEET) = 21.64
FLOW VELOCITY(FEET/SEC.) = 2.63 DEPTH*VELOCITY(FT*FT/SEC.) = 1.40

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 1286.0 FT WITH ELEVATION-DROP = 7.0 FT, IS 22.8 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 401.00
LONGEST FLOWPATH FROM NODE 401.10 TO NODE 401.00 = 1613.00 FEET.

FLOW PROCESS FROM NODE 401.00 TO NODE 401.00 IS CODE = 81

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

MAINLINE Tc(MIN.) = 17.07
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.009
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	GC10 Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	2.50	0.25	0.500	69
COMMERCIAL	C	2.90	0.25	0.100	69
NATURAL FAIR COVER					
"OPEN BRUSH"	C	0.30	0.25	1.000	77

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.323
 SUBAREA AREA(ACRES) = 5.70 SUBAREA RUNOFF(CFS) = 9.89
 EFFECTIVE AREA(ACRES) = 19.30 AREA-AVERAGED Fm(INCH/HR) = 0.07
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.29
 TOTAL AREA(ACRES) = 19.3 PEAK FLOW RATE(CFS) = 33.62

FLOW PROCESS FROM NODE 401.00 TO NODE 401.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 17.07
 RAINFALL INTENSITY(INCH/HR) = 2.01
 AREA-AVERAGED Fm(INCH/HR) = 0.07
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.29
 EFFECTIVE STREAM AREA(ACRES) = 19.30
 TOTAL STREAM AREA(ACRES) = 19.30
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 33.62

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	128.78	17.41	1.986	0.26(0.09)	0.36	69.6	399.90
1	128.96	17.49	1.981	0.26(0.09)	0.36	69.9	400.20
1	132.19	20.28	1.820	0.26(0.09)	0.36	78.8	399.10
1	129.99	21.10	1.779	0.26(0.09)	0.36	79.5	399.50
2	33.62	17.07	2.009	0.25(0.07)	0.29	19.3	401.10

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	161.39	17.07	2.009	0.26(0.09)	0.35	87.5	401.10
2	162.01	17.41	1.986	0.26(0.09)	0.35	88.9	399.90
3	162.09	17.49	1.981	0.26(0.09)	0.35	89.2	400.20
4	162.52	20.28	1.820	0.26(0.09)	0.35	98.1	399.10
5	159.61	21.10	1.779	0.26(0.09)	0.35	98.8	399.50

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 162.52 Tc(MIN.) = 20.28
 EFFECTIVE AREA(ACRES) = 98.07 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.35
 TOTAL AREA(ACRES) = 98.8
 LONGEST FLOWPATH FROM NODE 399.10 TO NODE 401.00 = 3292.00 FEET.

GC10

FLOW PROCESS FROM NODE 401.00 TO NODE 403.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 94.00 DOWNSTREAM(FEET) = 88.00
FLOW LENGTH(FEET) = 1124.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 60.0 INCH PIPE IS 44.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 10.40
ESTIMATED PIPE DIAMETER(INCH) = 60.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 162.52
PIPE TRAVEL TIME(MIN.) = 1.80 Tc(MIN.) = 22.08
LONGEST FLOWPATH FROM NODE 399.10 TO NODE 403.00 = 4416.00 FEET.

FLOW PROCESS FROM NODE 403.00 TO NODE 403.00 IS CODE = 1

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

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 22.08
RAINFALL INTENSITY(INCH/HR) = 1.73
AREA-AVERAGED Fm(INCH/HR) = 0.09
AREA-AVERAGED Fp(INCH/HR) = 0.26
AREA-AVERAGED Ap = 0.35
EFFECTIVE STREAM AREA(ACRES) = 98.07
TOTAL STREAM AREA(ACRES) = 98.80
PEAK FLOW RATE(CFS) AT CONFLUENCE = 162.52

FLOW PROCESS FROM NODE 402.10 TO NODE 402.20 IS CODE = 21

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 256.00
ELEVATION DATA: UPSTREAM(FEET) = 100.00 DOWNSTREAM(FEET) = 99.00

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

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.469

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.002

SUBAREA Tc AND LOSS RATE DATA(AMC II):

Table with 7 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN, Tc (MIN.). Rows include RESIDENTIAL and COMMERCIAL.

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.333

SUBAREA RUNOFF(CFS) = 6.30

TOTAL AREA(ACRES) = 2.40 PEAK FLOW RATE(CFS) = 6.30

FLOW PROCESS FROM NODE 402.20 TO NODE 402.30 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 99.00 DOWNSTREAM ELEVATION(FEET) = 95.00

GC10

STREET LENGTH(FEET) = 817.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 13.46

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.46
HALFSTREET FLOOD WIDTH(FEET) = 17.15
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.18
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.00
STREET FLOW TRAVEL TIME(MIN.) = 6.25 Tc(MIN.) = 14.72
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.187

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	4.50	0.25	0.500	69
COMMERCIAL	C	2.90	0.25	0.100	69
NATURAL FAIR COVER					
"OPEN BRUSH"	C	0.10	0.25	1.000	77

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.352
SUBAREA AREA(ACRES) = 7.50 SUBAREA RUNOFF(CFS) = 14.17
EFFECTIVE AREA(ACRES) = 9.90 AREA-AVERAGED Fm(INCH/HR) = 0.09
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.35
TOTAL AREA(ACRES) = 9.9 PEAK FLOW RATE(CFS) = 18.71

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.51 HALFSTREET FLOOD WIDTH(FEET) = 19.95
FLOW VELOCITY(FEET/SEC.) = 2.35 DEPTH*VELOCITY(FT*FT/SEC.) = 1.19
LONGEST FLOWPATH FROM NODE 402.10 TO NODE 402.30 = 1073.00 FEET.

FLOW PROCESS FROM NODE 402.30 TO NODE 402.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 3 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 95.00 DOWNSTREAM ELEVATION(FEET) = 92.00
STREET LENGTH(FEET) = 434.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 51.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 25.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 24.48

GC10

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.56
HALFSTREET FLOOD WIDTH(FEET) = 20.23
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.86
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.61
STREET FLOW TRAVEL TIME(MIN.) = 2.53 Tc(MIN.) = 17.25
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.997

SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Rows include RESIDENTIAL, "5-7 DWELLINGS/ACRE", APARTMENTS, COMMERCIAL, NATURAL FAIR COVER, "OPEN BRUSH".

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.337
SUBAREA AREA(ACRES) = 6.70 SUBAREA RUNOFF(CFS) = 11.53
EFFECTIVE AREA(ACRES) = 16.60 AREA-AVERAGED Fm(INCH/HR) = 0.09
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.34
TOTAL AREA(ACRES) = 16.6 PEAK FLOW RATE(CFS) = 28.55

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 21.45
FLOW VELOCITY(FEET/SEC.) = 2.98 DEPTH*VELOCITY(FT*FT/SEC.) = 1.75
LONGEST FLOWPATH FROM NODE 402.10 TO NODE 402.00 = 1507.00 FEET.

FLOW PROCESS FROM NODE 402.00 TO NODE 403.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 3 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 92.00 DOWNSTREAM ELEVATION(FEET) = 88.00
STREET LENGTH(FEET) = 727.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 51.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 25.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 49.58

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.71
HALFSTREET FLOOD WIDTH(FEET) = 30.19
AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.11
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.22
STREET FLOW TRAVEL TIME(MIN.) = 3.90 Tc(MIN.) = 21.15
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.777

SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Rows include RESIDENTIAL, "5-7 DWELLINGS/ACRE".

COMMERCIAL C 15.70 GC10 0.25 0.100 69
 NATURAL FAIR COVER
 "OPEN BRUSH" C 1.20 0.25 1.000 77
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.293
 SUBAREA AREA(ACRES) = 27.40 SUBAREA RUNOFF(CFS) = 42.01
 EFFECTIVE AREA(ACRES) = 44.00 AREA-AVERAGED Fm(INCH/HR) = 0.08
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.31
 TOTAL AREA(ACRES) = 44.0 PEAK FLOW RATE(CFS) = 67.27

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.78 HALFSTREET FLOOD WIDTH(FEET) = 36.83
 FLOW VELOCITY(FEET/SEC.) = 3.30 DEPTH*VELOCITY(FT*FT/SEC.) = 2.57
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 727.0 FT WITH ELEVATION-DROP = 4.0 FT, IS 58.8 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 403.00
 LONGEST FLOWPATH FROM NODE 402.10 TO NODE 403.00 = 2234.00 FEET.

 FLOW PROCESS FROM NODE 403.00 TO NODE 403.00 IS CODE = 1

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

=====
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 21.15
 RAINFALL INTENSITY(INCH/HR) = 1.78
 AREA-AVERAGED Fm(INCH/HR) = 0.08
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.31
 EFFECTIVE STREAM AREA(ACRES) = 44.00
 TOTAL STREAM AREA(ACRES) = 44.00
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 67.27

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	161.39	18.87	1.896	0.26(0.09)	0.35	87.5	401.10
1	162.01	19.21	1.877	0.26(0.09)	0.35	88.9	399.90
1	162.09	19.29	1.873	0.26(0.09)	0.35	89.2	400.20
1	162.52	22.08	1.733	0.26(0.09)	0.35	98.1	399.10
1	159.61	22.91	1.697	0.26(0.09)	0.35	98.8	399.50
2	67.27	21.15	1.777	0.25(0.08)	0.31	44.0	402.10

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	225.65	18.87	1.896	0.25(0.09)	0.34	126.8	401.10
2	226.73	19.21	1.877	0.25(0.09)	0.34	128.9	399.90
3	226.92	19.29	1.873	0.25(0.09)	0.34	129.3	400.20
4	229.64	21.15	1.777	0.25(0.09)	0.34	139.1	402.10
5	228.07	22.08	1.733	0.25(0.09)	0.34	142.1	399.10
6	223.73	22.91	1.697	0.25(0.09)	0.34	142.8	399.50

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 229.64 Tc(MIN.) = 21.15

GC10

EFFECTIVE AREA(ACRES) = 139.10 AREA-AVERAGED Fm(INCH/HR) = 0.09
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.34
TOTAL AREA(ACRES) = 142.8
LONGEST FLOWPATH FROM NODE 399.10 TO NODE 403.00 = 4416.00 FEET.

FLOW PROCESS FROM NODE 403.00 TO NODE 408.00 IS CODE = 31

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

ELEVATION DATA: UPSTREAM(FEET) = 88.00 DOWNSTREAM(FEET) = 76.00
FLOW LENGTH(FEET) = 3339.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 72.0 INCH PIPE IS 56.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 9.70
ESTIMATED PIPE DIAMETER(INCH) = 72.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 229.64
PIPE TRAVEL TIME(MIN.) = 5.74 Tc(MIN.) = 26.89
LONGEST FLOWPATH FROM NODE 399.10 TO NODE 408.00 = 7755.00 FEET.

FLOW PROCESS FROM NODE 408.00 TO NODE 408.00 IS CODE = 1

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

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 26.89
RAINFALL INTENSITY(INCH/HR) = 1.55
AREA-AVERAGED Fm(INCH/HR) = 0.09
AREA-AVERAGED Fp(INCH/HR) = 0.25
AREA-AVERAGED Ap = 0.34
EFFECTIVE STREAM AREA(ACRES) = 139.10
TOTAL STREAM AREA(ACRES) = 142.80
PEAK FLOW RATE(CFS) AT CONFLUENCE = 229.64

FLOW PROCESS FROM NODE 404.00 TO NODE 405.00 IS CODE = 21

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 88.00 DOWNSTREAM(FEET) = 87.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.862
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751

SUBAREA Tc AND LOSS RATE DATA(AMC II):

Table with 7 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN, Tc (MIN.). Rows include RESIDENTIAL, COMMERCIAL, URBAN POOR COVER, and TURF.

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.440
SUBAREA RUNOFF(CFS) = 23.77
TOTAL AREA(ACRES) = 10.00 PEAK FLOW RATE(CFS) = 23.77

GC10

 FLOW PROCESS FROM NODE 405.00 TO NODE 406.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 2 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 87.00 DOWNSTREAM ELEVATION(FEET) = 86.50
 STREET LENGTH(FEET) = 352.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 34.50
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.78
 HALFSTREET FLOOD WIDTH(FEET) = 37.17
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.67
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.31
 STREET FLOW TRAVEL TIME(MIN.) = 3.51 Tc(MIN.) = 13.37
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.310

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	6.80	0.25	0.500	69
COMMERCIAL	C	3.20	0.25	0.100	69
URBAN POOR COVER					
"TURF"	C	0.80	0.25	1.000	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.419
 SUBAREA AREA(ACRES) = 10.80 SUBAREA RUNOFF(CFS) = 21.44
 EFFECTIVE AREA(ACRES) = 20.80 AREA-AVERAGED Fm(INCH/HR) = 0.11
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.43
 TOTAL AREA(ACRES) = 20.8 PEAK FLOW RATE(CFS) = 41.24

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.83 HALFSTREET FLOOD WIDTH(FEET) = 41.27
 FLOW VELOCITY(FEET/SEC.) = 1.73 DEPTH*VELOCITY(FT*FT/SEC.) = 1.43
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 352.0 FT WITH ELEVATION-DROP = 0.5 FT, IS 23.1 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 406.00
 LONGEST FLOWPATH FROM NODE 404.00 TO NODE 406.00 = 682.00 FEET.

 FLOW PROCESS FROM NODE 406.00 TO NODE 407.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 2 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 86.50 DOWNSTREAM ELEVATION(FEET) = 84.00
 STREET LENGTH(FEET) = 1031.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 42.00

GC10

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 46.31
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.79
HALFSTREET FLOOD WIDTH(FEET) = 37.66
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.20
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.74
STREET FLOW TRAVEL TIME(MIN.) = 7.80 Tc(MIN.) = 21.18
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.775

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	1.60	0.25	0.500	69
COMMERCIAL	C	3.10	0.25	0.100	69
URBAN POOR COVER					
"TURF"	C	2.10	0.25	1.000	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.472
SUBAREA AREA(ACRES) = 6.80 SUBAREA RUNOFF(CFS) = 10.14
EFFECTIVE AREA(ACRES) = 27.60 AREA-AVERAGED Fm(INCH/HR) = 0.11
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.44
TOTAL AREA(ACRES) = 27.6 PEAK FLOW RATE(CFS) = 41.37

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.76 HALFSTREET FLOOD WIDTH(FEET) = 35.20
FLOW VELOCITY(FEET/SEC.) = 2.15 DEPTH*VELOCITY(FT*FT/SEC.) = 1.64
LONGEST FLOWPATH FROM NODE 404.00 TO NODE 407.00 = 1713.00 FEET.

FLOW PROCESS FROM NODE 407.00 TO NODE 408.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 2 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 84.00 DOWNSTREAM ELEVATION(FEET) = 76.00
STREET LENGTH(FEET) = 1632.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 63.19
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.78

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HALFSTREET FLOOD WIDTH(FEET) = 36.84
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.10
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.42
 STREET FLOW TRAVEL TIME(MIN.) = 8.79 Tc(MIN.) = 29.96
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.455
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	22.30	0.25	0.500	69
COMMERCIAL	C	12.40	0.25	0.100	69
URBAN POOR COVER					
"TURF"	C	0.80	0.25	1.000	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.372
 SUBAREA AREA(ACRES) = 35.50 SUBAREA RUNOFF(CFS) = 43.52
 EFFECTIVE AREA(ACRES) = 63.10 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.40
 TOTAL AREA(ACRES) = 63.1 PEAK FLOW RATE(CFS) = 76.94

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.83 HALFSTREET FLOOD WIDTH(FEET) = 41.44
 FLOW VELOCITY(FEET/SEC.) = 3.20 DEPTH*VELOCITY(FT*FT/SEC.) = 2.65
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 AND L = 1632.0 FT WITH ELEVATION-DROP = 8.0 FT, IS 61.4 CFS,
 WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 408.00
 LONGEST FLOWPATH FROM NODE 404.00 TO NODE 408.00 = 3345.00 FEET.

FLOW PROCESS FROM NODE 408.00 TO NODE 408.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 29.96
 RAINFALL INTENSITY(INCH/HR) = 1.46
 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.40
 EFFECTIVE STREAM AREA(ACRES) = 63.10
 TOTAL STREAM AREA(ACRES) = 63.10
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 76.94

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	225.65	24.62	1.628	0.25(0.09)	0.34	126.8	401.10
1	226.73	24.96	1.616	0.25(0.09)	0.34	128.9	399.90
1	226.92	25.04	1.613	0.25(0.09)	0.34	129.3	400.20
1	229.64	26.89	1.548	0.25(0.09)	0.34	139.1	402.10
1	228.07	27.83	1.518	0.25(0.09)	0.34	142.1	399.10
1	223.73	28.66	1.493	0.25(0.09)	0.34	142.8	399.50
2	76.94	29.96	1.455	0.25(0.10)	0.40	63.1	404.00

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

** PEAK FLOW RATE TABLE **

GC10							
STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	296.95	24.62	1.628	0.25(0.09)	0.36	178.6	401.10
2	298.42	24.96	1.616	0.25(0.09)	0.36	181.4	399.90
3	298.69	25.04	1.613	0.25(0.09)	0.36	182.1	400.20
4	303.43	26.89	1.548	0.25(0.09)	0.36	195.7	402.10
5	302.84	27.83	1.518	0.25(0.09)	0.36	200.7	399.10
6	299.36	28.66	1.493	0.25(0.09)	0.36	203.2	399.50
7	294.69	29.96	1.455	0.25(0.09)	0.36	205.9	404.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 303.43 Tc(MIN.) = 26.89
 EFFECTIVE AREA(ACRES) = 195.72 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.36
 TOTAL AREA(ACRES) = 205.9
 LONGEST FLOWPATH FROM NODE 399.10 TO NODE 408.00 = 7755.00 FEET.

FLOW PROCESS FROM NODE 408.00 TO NODE 415.00 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 76.00 DOWNSTREAM(FEET) = 54.00
 FLOW LENGTH(FEET) = 4095.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 75.0 INCH PIPE IS 56.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 12.15
 ESTIMATED PIPE DIAMETER(INCH) = 75.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 303.43
 PIPE TRAVEL TIME(MIN.) = 5.62 Tc(MIN.) = 32.51
 LONGEST FLOWPATH FROM NODE 399.10 TO NODE 415.00 = 11850.00 FEET.

FLOW PROCESS FROM NODE 415.00 TO NODE 415.00 IS CODE = 1

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

=====

TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION(MIN.) = 32.51
 RAINFALL INTENSITY(INCH/HR) = 1.39
 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.36
 EFFECTIVE STREAM AREA(ACRES) = 195.72
 TOTAL STREAM AREA(ACRES) = 205.90
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 303.43

FLOW PROCESS FROM NODE 409.00 TO NODE 410.00 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
 ELEVATION DATA: UPSTREAM(FEET) = 76.00 DOWNSTREAM(FEET) = 74.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.586
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978

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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	C	0.60	0.25	0.100	69	8.59
URBAN POOR COVER "TURF"	C	0.20	0.25	1.000	83	14.83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.325
 SUBAREA RUNOFF(CFS) = 2.09
 TOTAL AREA(ACRES) = 0.80 PEAK FLOW RATE(CFS) = 2.09

FLOW PROCESS FROM NODE 410.00 TO NODE 411.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 2 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 74.00 DOWNSTREAM ELEVATION(FEET) = 71.00
 STREET LENGTH(FEET) = 452.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.11
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.33
 HALFSTREET FLOOD WIDTH(FEET) = 8.35
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.75
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.57
 STREET FLOW TRAVEL TIME(MIN.) = 4.29 Tc(MIN.) = 12.88
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.361

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	0.70	0.25	0.100	69
URBAN POOR COVER "TURF"	C	0.30	0.25	1.000	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.370
 SUBAREA AREA(ACRES) = 1.00 SUBAREA RUNOFF(CFS) = 2.04
 EFFECTIVE AREA(ACRES) = 1.80 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.35
 TOTAL AREA(ACRES) = 1.8 PEAK FLOW RATE(CFS) = 3.68

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.34 HALFSTREET FLOOD WIDTH(FEET) = 9.09
 FLOW VELOCITY(FEET/SEC.) = 1.81 DEPTH*VELOCITY(FT*FT/SEC.) = 0.62
 LONGEST FLOWPATH FROM NODE 409.00 TO NODE 411.00 = 782.00 FEET.

FLOW PROCESS FROM NODE 411.00 TO NODE 412.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 2 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 71.00 DOWNSTREAM ELEVATION(FEET) = 61.00
 STREET LENGTH(FEET) = 1897.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.95
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.40
 HALFSTREET FLOOD WIDTH(FEET) = 11.91
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.85
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.73
 STREET FLOW TRAVEL TIME(MIN.) = 17.09 Tc(MIN.) = 29.97
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.455

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL URBAN POOR COVER "TURF"	C	2.20	0.25	0.100	69
	C	1.50	0.25	1.000	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.465
 SUBAREA AREA(ACRES) = 3.70 SUBAREA RUNOFF(CFS) = 4.46
 EFFECTIVE AREA(ACRES) = 5.50 AREA-AVERAGED Fm(INCH/HR) = 0.11
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.43
 TOTAL AREA(ACRES) = 5.5 PEAK FLOW RATE(CFS) = 6.67

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.41 HALFSTREET FLOOD WIDTH(FEET) = 12.50
 FLOW VELOCITY(FEET/SEC.) = 1.90 DEPTH*VELOCITY(FT*FT/SEC.) = 0.78
 LONGEST FLOWPATH FROM NODE 409.00 TO NODE 412.00 = 2679.00 FEET.

FLOW PROCESS FROM NODE 412.00 TO NODE 413.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 2 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 61.00 DOWNSTREAM ELEVATION(FEET) = 60.00
 STREET LENGTH(FEET) = 413.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

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**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.09

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.51

HALFSTREET FLOOD WIDTH(FEET) = 17.47

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.56

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.79

STREET FLOW TRAVEL TIME(MIN.) = 4.43 Tc(MIN.) = 34.39

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.345

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	3.30	0.25	0.100	69
SCHOOL	C	2.70	0.25	0.600	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.325

SUBAREA AREA(ACRES) = 6.00 SUBAREA RUNOFF(CFS) = 6.82

EFFECTIVE AREA(ACRES) = 11.50 AREA-AVERAGED Fm(INCH/HR) = 0.09

AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.37

TOTAL AREA(ACRES) = 11.5 PEAK FLOW RATE(CFS) = 12.95

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.54 HALFSTREET FLOOD WIDTH(FEET) = 19.33

FLOW VELOCITY(FEET/SEC.) = 1.65 DEPTH*VELOCITY(FT*FT/SEC.) = 0.90

LONGEST FLOWPATH FROM NODE 409.00 TO NODE 413.00 = 3092.00 FEET.

FLOW PROCESS FROM NODE 413.00 TO NODE 414.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 2 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 60.00 DOWNSTREAM ELEVATION(FEET) = 57.00

STREET LENGTH(FEET) = 463.00 CURB HEIGHT(INCHES) = 8.0

STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 22.20

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.55

HALFSTREET FLOOD WIDTH(FEET) = 19.70

AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.73

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.51

STREET FLOW TRAVEL TIME(MIN.) = 2.83 Tc(MIN.) = 37.22

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.285

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	0.60	0.25	0.500	69
COMMERCIAL	C	9.90	0.25	0.100	69
SCHOOL	C	6.50	0.25	0.600	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

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SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.305
SUBAREA AREA(ACRES) = 17.00 SUBAREA RUNOFF(CFS) = 18.49
EFFECTIVE AREA(ACRES) = 28.50 AREA-AVERAGED Fm(INCH/HR) = 0.08
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.33
TOTAL AREA(ACRES) = 28.5 PEAK FLOW RATE(CFS) = 30.83

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.61 HALFSTREET FLOOD WIDTH(FEET) = 22.44
FLOW VELOCITY(FEET/SEC.) = 2.95 DEPTH*VELOCITY(FT*FT/SEC.) = 1.79
LONGEST FLOWPATH FROM NODE 409.00 TO NODE 414.00 = 3555.00 FEET.

FLOW PROCESS FROM NODE 414.00 TO NODE 415.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 2 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 57.00 DOWNSTREAM ELEVATION(FEET) = 54.00
STREET LENGTH(FEET) = 819.00 CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

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

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 51.38
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.77
HALFSTREET FLOOD WIDTH(FEET) = 35.36
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.66
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.03
STREET FLOW TRAVEL TIME(MIN.) = 5.14 Tc(MIN.) = 42.36
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.193

SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Rows include RESIDENTIAL, COMMERCIAL, URBAN POOR COVER, and SCHOOL.

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.425
SUBAREA AREA(ACRES) = 42.00 SUBAREA RUNOFF(CFS) = 41.09
EFFECTIVE AREA(ACRES) = 70.50 AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.39
TOTAL AREA(ACRES) = 70.5 PEAK FLOW RATE(CFS) = 69.56

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.84 HALFSTREET FLOOD WIDTH(FEET) = 42.58
FLOW VELOCITY(FEET/SEC.) = 2.79 DEPTH*VELOCITY(FT*FT/SEC.) = 2.33

*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
AND L = 819.0 FT WITH ELEVATION-DROP = 3.0 FT, IS 82.3 CFS,
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 415.00

GC10

LONGEST FLOWPATH FROM NODE 409.00 TO NODE 415.00 = 4374.00 FEET.

FLOW PROCESS FROM NODE 415.00 TO NODE 415.00 IS CODE = 1

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

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TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) = 42.36
 RAINFALL INTENSITY(INCH/HR) = 1.19
 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.25
 AREA-AVERAGED Ap = 0.39
 EFFECTIVE STREAM AREA(ACRES) = 70.50
 TOTAL STREAM AREA(ACRES) = 70.50
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 69.56

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	296.95	30.25	1.447	0.25(0.09)	0.36	178.6	401.10
1	298.42	30.59	1.438	0.25(0.09)	0.36	181.4	399.90
1	298.69	30.66	1.436	0.25(0.09)	0.36	182.1	400.20
1	303.43	32.51	1.389	0.25(0.09)	0.36	195.7	402.10
1	302.84	33.45	1.366	0.25(0.09)	0.36	200.7	399.10
1	299.36	34.29	1.347	0.25(0.09)	0.36	203.2	399.50
1	294.69	35.60	1.318	0.25(0.09)	0.36	205.9	404.00
2	69.56	42.36	1.193	0.25(0.10)	0.39	70.5	409.00

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	358.14	30.25	1.447	0.25(0.09)	0.36	229.0	401.10
2	359.86	30.59	1.438	0.25(0.09)	0.36	232.3	399.90
3	360.19	30.66	1.436	0.25(0.09)	0.36	233.1	400.20
4	366.33	32.51	1.389	0.25(0.09)	0.36	249.8	402.10
5	366.43	33.45	1.366	0.25(0.09)	0.36	256.3	399.10
6	363.56	34.29	1.347	0.25(0.09)	0.36	260.2	399.50
7	359.82	35.60	1.318	0.25(0.09)	0.36	265.1	404.00
8	334.25	42.36	1.193	0.25(0.09)	0.37	276.4	409.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 366.43 Tc(MIN.) = 33.45
 EFFECTIVE AREA(ACRES) = 256.33 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.36
 TOTAL AREA(ACRES) = 276.4
 LONGEST FLOWPATH FROM NODE 399.10 TO NODE 415.00 = 11850.00 FEET.

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END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 276.4 TC(MIN.) = 33.45
 EFFECTIVE AREA(ACRES) = 256.33 AREA-AVERAGED Fm(INCH/HR)= 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.364
 PEAK FLOW RATE(CFS) = 366.43

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	GC10		Ae (ACRES)	HEADWATER NODE
				Fp(Fm) (INCH/HR)	Ap		
1	358.14	30.25	1.447	0.25(0.09)	0.36	229.0	401.10
2	359.86	30.59	1.438	0.25(0.09)	0.36	232.3	399.90
3	360.19	30.66	1.436	0.25(0.09)	0.36	233.1	400.20
4	366.33	32.51	1.389	0.25(0.09)	0.36	249.8	402.10
5	366.43	33.45	1.366	0.25(0.09)	0.36	256.3	399.10
6	363.56	34.29	1.347	0.25(0.09)	0.36	260.2	399.50
7	359.82	35.60	1.318	0.25(0.09)	0.36	265.1	404.00
8	334.25	42.36	1.193	0.25(0.09)	0.37	276.4	409.00

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END OF RATIONAL METHOD ANALYSIS

