

CANYON RANCH PRELIMINARY HYDROLOGY REPORT

TTM 20402

Prepared for:
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May 2021

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PROACTIVE
ENGINEERING CONSULTANTS

a different kind of company

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BASIN 'A'

INTRODUCTION

The Project - Tentative Tract Map 20402 is a proposed residential community encompassing approximately 25.1 acres within the City of Redlands, California. The project site is bounded by San Timoteo Canyon Rd to the west, existing residential site to the north and east, and agricultural land to the south. See **Figure 1 – Vicinity Map** for reference. The proposed Project consists of residential lots and an infiltration basin. This study has been prepared to examine the hydrology impacts associated with the proposed Project as described below:

1. Perform hydrology calculations for existing conditions and proposed ultimate land used for TTM 20402.
2. Examine differences between pre-and post-development flows to identify the preliminary infiltration basin sizing and potential downstream impacts to the San Timoteo Creek.

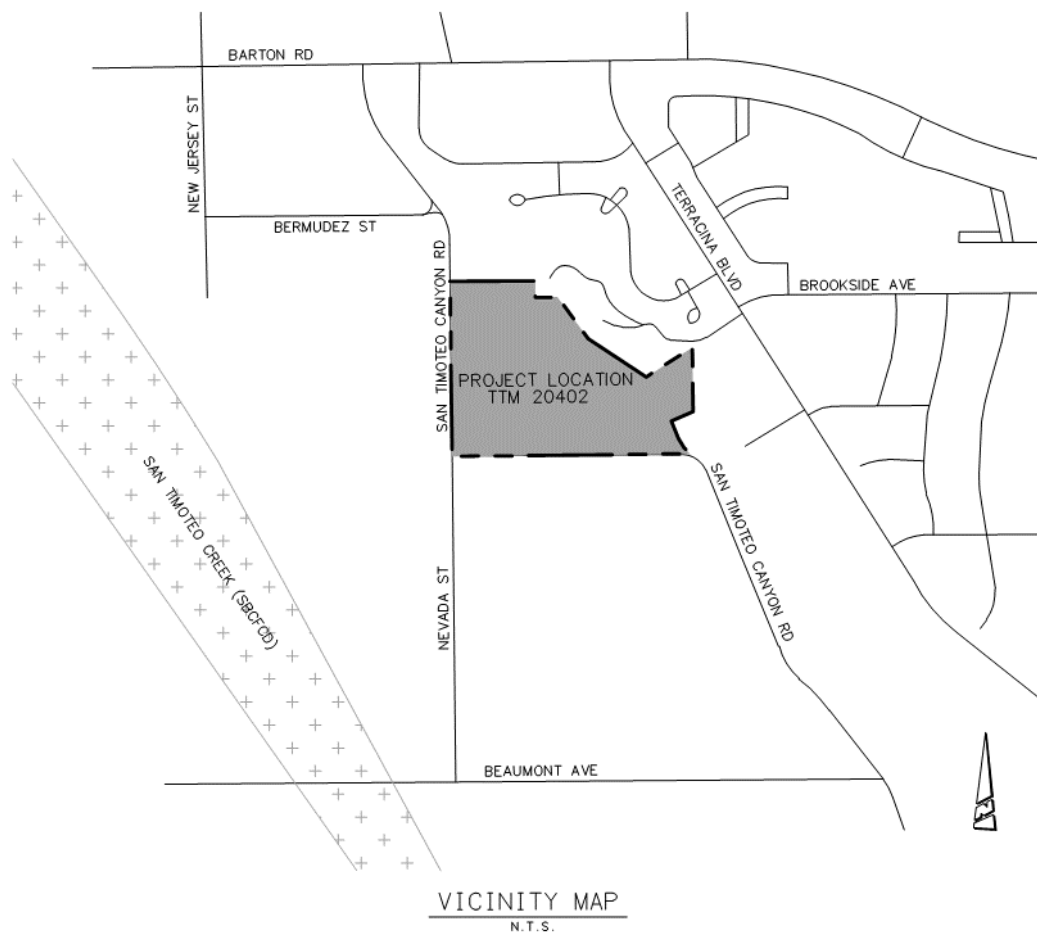


Figure 1 – Vicinity Map

HYDROLOGY ANALYSIS AND METHODOLOGY

HYDROLOGY CRITERIA

This study has been prepared in conformance with the hydrological procedure and standards set forth in the San Bernardino County Hydrology Manual.

Due to the size of the watershed (less than 640 acres), the rational method is used to calculate the peak runoff at each concentration point for the existing and proposed conditions. The point precipitation value for the 100-year event is used in the rational method analysis.

Accommodating to the City of Redlands policy of mitigating developed condition discharge to 80% of existing flows, the hydrograph method is utilized to size the required bioretention basin for the Project. Point precipitation values for the 100-year event are utilized in the hydrograph analysis.

The precipitation values utilized in this report are derived from the NOAA 14 Atlas as shown in Appendix A.

The antecedent moisture content (AMC) used for the 100-year analysis is AMC III per the San Bernardino Hydrology Manual.

LAND USE DEVELOPMENT

The site of TTM 20402 was an orange orchard and is currently composed of grassland with poor cover. In the proposed condition, residential land use will generally maintain the existing drainage pattern. Runoff will be conveyed via surface flows to proposed catch basins and outlet into a proposed combined infiltration/water quality basin. From here, flows will exit via a designated discharge point and travel west across San Timoteo Canyon Rd to join the adjacent site of TTM 20404 where a single connection to the creek is proposed.

WATERSHED DESCRIPTION AND DRAINAGE PATTERNS

The Project site drainage for TTM 20402 is tributary to the San Timoteo Creek. The existing ground surface generally slopes from southeast to northwest in the 1% to 2% range. The Project Site is a minor tributary of the Santa Ana River Watershed and ultimately outlets to the Santa Ana River located northwest of the site.

INFILTRATION AND SOILS

The most significant factor affecting infiltration is the nature of the soil in the watershed. Accordingly, the U.S. Department of Agriculture Soil Conservation Service (now the Natural Resource Conservation Service) classifies soil according to their infiltration capacity. Soils in the study area are classified as SCS Soil Type A and B and details are included in Appendix A.

Group A soils have a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B soils have slow infiltration rates when thoroughly wetted and consist mainly of silty-loam soils with a layer that impedes downward movement of water, or soils with moderately fine to fine texture. These soils have a slow rate of water transmission.

Other important factors in soil infiltration are the antecedent moisture condition (AMC) and land use/soil cover. Following the methodology outlined in the San Bernardino County Hydrology manual, an AMC III (highest runoff potential) is assumed for events with a 100-year return period. AMC II is used for 10, 25, and 50-year return frequency storms and AMC 1 is used for 2 and 5-year storms.

WATERSHED MODEL DEVELOPMENT

This study uses the Advance Engineering Software (AES) HydroWIN v. 2015 Rational Method Analysis computer program. The computer program utilizes San Bernardino County methodology to perform the hydrologic analysis. As a result of the existing topography, the proposed condition's hydrology has been modeled to generally continue the existing condition hydrology by flowing from southeast to northwest. To accurately reflect the impacts of the project to the downstream channel, existing and proposed flows have been analyzed. See the Existing Hydrology Study and Proposed Hydrology Study in Appendix A and B, respectively.

In accordance with the City of Redland's requirement to limit post development discharge to 80% of existing, AES v. 2015 is utilized to demonstrate the effects of the proposed infiltration/water quality basin. The results of the unit hydrographs and basin routing are summarized in Tables 1 and 2 below. See Appendix C for the unit hydrograph and basin routing calculations.

While the infiltration and water quality basins are combined, they have been designed to function independent of each other (no water quality/infiltration volume overlap).

HYDROLOGY RESULTS

The results, based on the San Bernardino County Hydrology Manual guidelines for rational method and basin routing computer models developed using AES software, are summarized in Table 1. The Hydrology Maps for the Existing and Proposed conditions can be found in Appendix A and Appendix B, respectively.

Table 1 - TTM 20402 100 Year Storm Event (Rational Method)

		Existing Condition	Proposed Condition	% of Existing Q100
TTM 20402	Peak Flow (Q100)	45.7 cfs	42.3 cfs	93%
	Area	25.1 acres	24.5 acres	
	Time of Concentration (Tc)	13.1 min	11.9 min	

FLOW ATTENUATION ANALYSIS

As stated above, the City of Redlands criteria is that the project must attenuate flows to 80% of the pre-development condition. To achieve this threshold, flows from TTM 20402 will be attenuated using an infiltration basin. Preliminary sizing for the infiltration basin is calculated using the San Bernardino County hydrograph and basin routing procedures. The results are as follows:

Table 2 - TTM 20402 100 Year Storm Event (Flow Attenuation Summary)

		Proposed Condition	Outflow % of Existing Q100
TTM 20402	Peak Inflow (Q100)	42.3 cfs	63%
	Max Storage volume	0.18 ac-ft	
	Peak Outflow	29.0 cfs	

CONCLUSION

Preliminary hydrology for the Project at TTM 20402 has been completed for the existing and proposed 100-year events. With the use of an infiltration basin, the proposed peak flow has been mitigated to less than 80% of the existing flow as required by the City of Redlands. Since the proposed flow has been mitigated to meet city requirements, no downstream impacts to the San Timoteo Creek are expected.

APPENDIX A – EXISTING HYDROLOGY ANALYSIS (RATIONAL METHOD)

NOAA 14 ATLAS



NOAA Atlas 14, Volume 6, Version 2
Location name: Redlands, California, USA*
Latitude: 34.0438°, Longitude: -117.2155°
Elevation: 1240.63 ft**

* source: ESRI Maps

** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps_&_aerials](#)

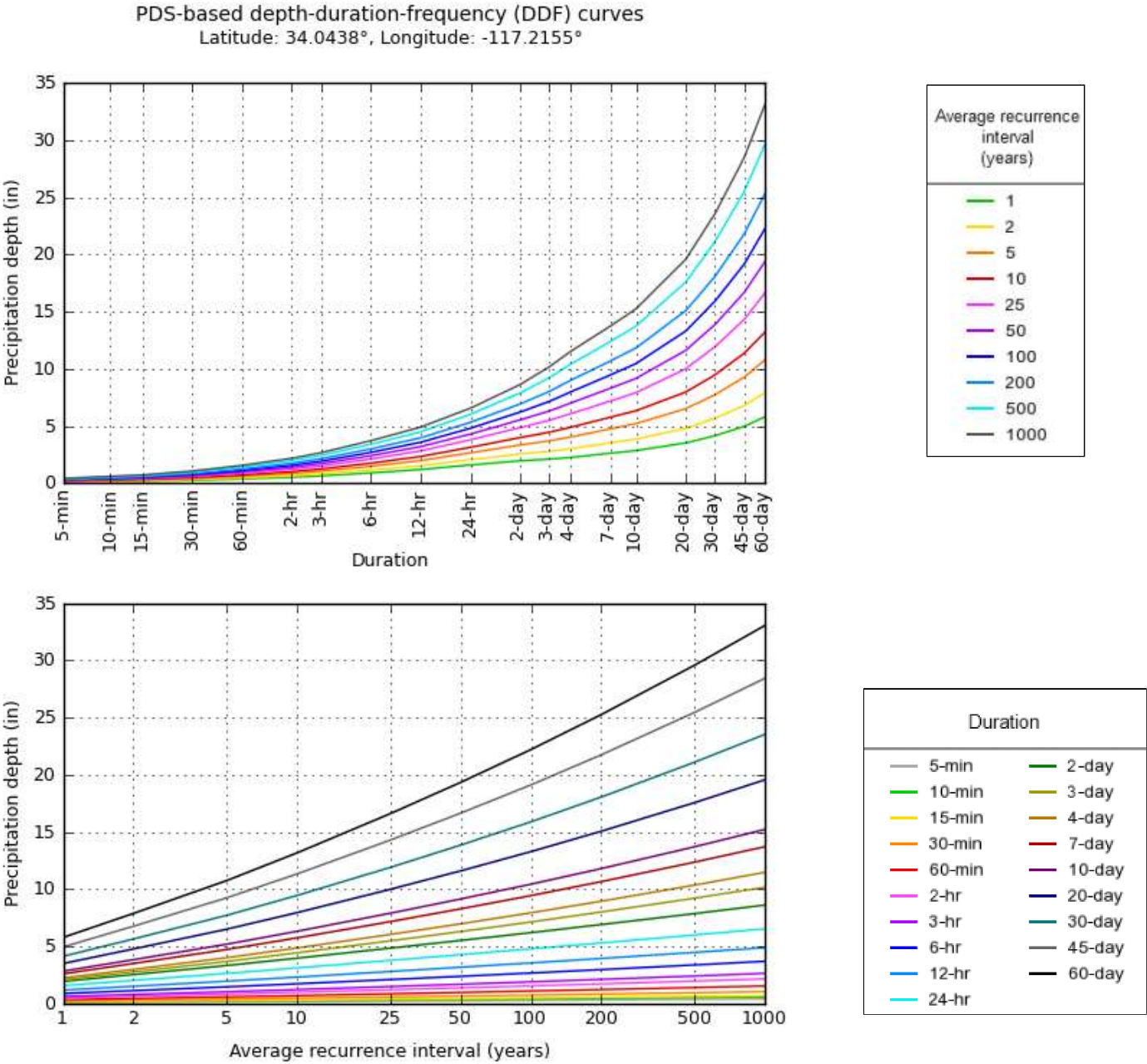
PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.096 (0.080-0.117)	0.124 (0.103-0.150)	0.160 (0.133-0.195)	0.190 (0.156-0.233)	0.231 (0.184-0.294)	0.263 (0.205-0.342)	0.296 (0.224-0.394)	0.330 (0.243-0.453)	0.377 (0.266-0.539)	0.413 (0.282-0.613)
10-min	0.138 (0.115-0.167)	0.177 (0.147-0.215)	0.229 (0.190-0.279)	0.272 (0.224-0.334)	0.331 (0.263-0.421)	0.377 (0.293-0.490)	0.424 (0.322-0.565)	0.473 (0.349-0.649)	0.540 (0.381-0.773)	0.593 (0.404-0.878)
15-min	0.167 (0.139-0.202)	0.214 (0.178-0.260)	0.277 (0.230-0.338)	0.329 (0.271-0.404)	0.401 (0.318-0.509)	0.456 (0.355-0.592)	0.513 (0.389-0.683)	0.572 (0.422-0.784)	0.653 (0.461-0.935)	0.717 (0.488-1.06)
30-min	0.246 (0.205-0.298)	0.316 (0.263-0.384)	0.409 (0.339-0.498)	0.486 (0.399-0.596)	0.591 (0.470-0.751)	0.673 (0.523-0.874)	0.757 (0.574-1.01)	0.844 (0.622-1.16)	0.963 (0.680-1.38)	1.06 (0.720-1.57)
60-min	0.362 (0.301-0.439)	0.465 (0.387-0.565)	0.602 (0.499-0.733)	0.714 (0.588-0.877)	0.869 (0.691-1.11)	0.990 (0.770-1.29)	1.11 (0.844-1.48)	1.24 (0.915-1.70)	1.42 (1.00-2.03)	1.56 (1.06-2.30)
2-hr	0.515 (0.429-0.624)	0.659 (0.548-0.801)	0.850 (0.705-1.04)	1.01 (0.829-1.24)	1.22 (0.972-1.56)	1.39 (1.08-1.81)	1.56 (1.18-2.08)	1.74 (1.28-2.38)	1.98 (1.40-2.84)	2.17 (1.48-3.22)
3-hr	0.635 (0.529-0.770)	0.813 (0.676-0.987)	1.05 (0.868-1.27)	1.24 (1.02-1.52)	1.50 (1.19-1.91)	1.71 (1.33-2.22)	1.92 (1.45-2.55)	2.13 (1.57-2.92)	2.43 (1.71-3.47)	2.66 (1.81-3.94)
6-hr	0.896 (0.746-1.09)	1.15 (0.953-1.39)	1.48 (1.22-1.80)	1.75 (1.44-2.14)	2.11 (1.68-2.69)	2.40 (1.86-3.11)	2.69 (2.04-3.58)	2.99 (2.20-4.09)	3.39 (2.40-4.85)	3.71 (2.53-5.50)
12-hr	1.19 (0.993-1.45)	1.53 (1.27-1.86)	1.97 (1.63-2.40)	2.33 (1.92-2.86)	2.82 (2.24-3.58)	3.19 (2.48-4.14)	3.57 (2.71-4.76)	3.96 (2.92-5.43)	4.49 (3.17-6.42)	4.90 (3.34-7.26)
24-hr	1.59 (1.41-1.83)	2.05 (1.81-2.36)	2.65 (2.34-3.06)	3.13 (2.74-3.66)	3.79 (3.21-4.57)	4.29 (3.56-5.28)	4.80 (3.89-6.04)	5.32 (4.19-6.88)	6.01 (4.55-8.11)	6.55 (4.79-9.13)
2-day	1.95 (1.73-2.25)	2.55 (2.26-2.95)	3.34 (2.95-3.87)	3.98 (3.49-4.65)	4.86 (4.11-5.85)	5.53 (4.59-6.80)	6.22 (5.04-7.83)	6.92 (5.46-8.96)	7.88 (5.96-10.6)	8.62 (6.31-12.0)
3-day	2.10 (1.86-2.42)	2.78 (2.46-3.21)	3.70 (3.26-4.28)	4.45 (3.90-5.19)	5.50 (4.65-6.62)	6.31 (5.24-7.76)	7.15 (5.79-9.00)	8.02 (6.32-10.4)	9.23 (6.98-12.4)	10.2 (7.45-14.2)
4-day	2.25 (1.99-2.59)	3.01 (2.66-3.47)	4.02 (3.55-4.66)	4.87 (4.26-5.68)	6.06 (5.13-7.30)	6.99 (5.80-8.59)	7.95 (6.44-10.0)	8.96 (7.07-11.6)	10.4 (7.85-14.0)	11.5 (8.40-16.0)
7-day	2.61 (2.32-3.01)	3.52 (3.11-4.06)	4.74 (4.18-5.48)	5.76 (5.04-6.71)	7.17 (6.08-8.64)	8.29 (6.88-10.2)	9.45 (7.66-11.9)	10.7 (8.41-13.8)	12.4 (9.37-16.7)	13.7 (10.0-19.1)
10-day	2.85 (2.52-3.28)	3.85 (3.40-4.44)	5.20 (4.59-6.02)	6.33 (5.54-7.38)	7.91 (6.70-9.53)	9.15 (7.60-11.3)	10.5 (8.47-13.2)	11.8 (9.31-15.3)	13.7 (10.4-18.5)	15.2 (11.1-21.2)
20-day	3.52 (3.11-4.05)	4.79 (4.24-5.53)	6.51 (5.75-7.54)	7.96 (6.97-9.29)	10.00 (8.47-12.0)	11.6 (9.63-14.3)	13.3 (10.8-16.7)	15.1 (11.9-19.5)	17.6 (13.3-23.7)	19.6 (14.3-27.3)
30-day	4.14 (3.67-4.78)	5.66 (5.01-6.54)	7.73 (6.81-8.94)	9.46 (8.28-11.0)	11.9 (10.1-14.4)	13.9 (11.5-17.0)	15.9 (12.9-20.0)	18.1 (14.2-23.4)	21.1 (16.0-28.5)	23.5 (17.2-32.8)
45-day	4.96 (4.39-5.72)	6.78 (5.99-7.82)	9.25 (8.16-10.7)	11.3 (9.92-13.2)	14.3 (12.1-17.2)	16.7 (13.8-20.5)	19.1 (15.5-24.1)	21.8 (17.2-28.2)	25.5 (19.3-34.3)	28.4 (20.8-39.7)
60-day	5.79 (5.13-6.67)	7.89 (6.98-9.11)	10.8 (9.49-12.5)	13.2 (11.5-15.4)	16.6 (14.1-20.0)	19.3 (16.0-23.8)	22.2 (18.0-28.0)	25.3 (19.9-32.7)	29.6 (22.4-39.9)	33.1 (24.2-46.1)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).
 Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.
 Please refer to NOAA Atlas 14 document for more information.

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PF graphical



Maps & aerials

Small scale terrain



Large scale terrain



Large scale map



Large scale aerial



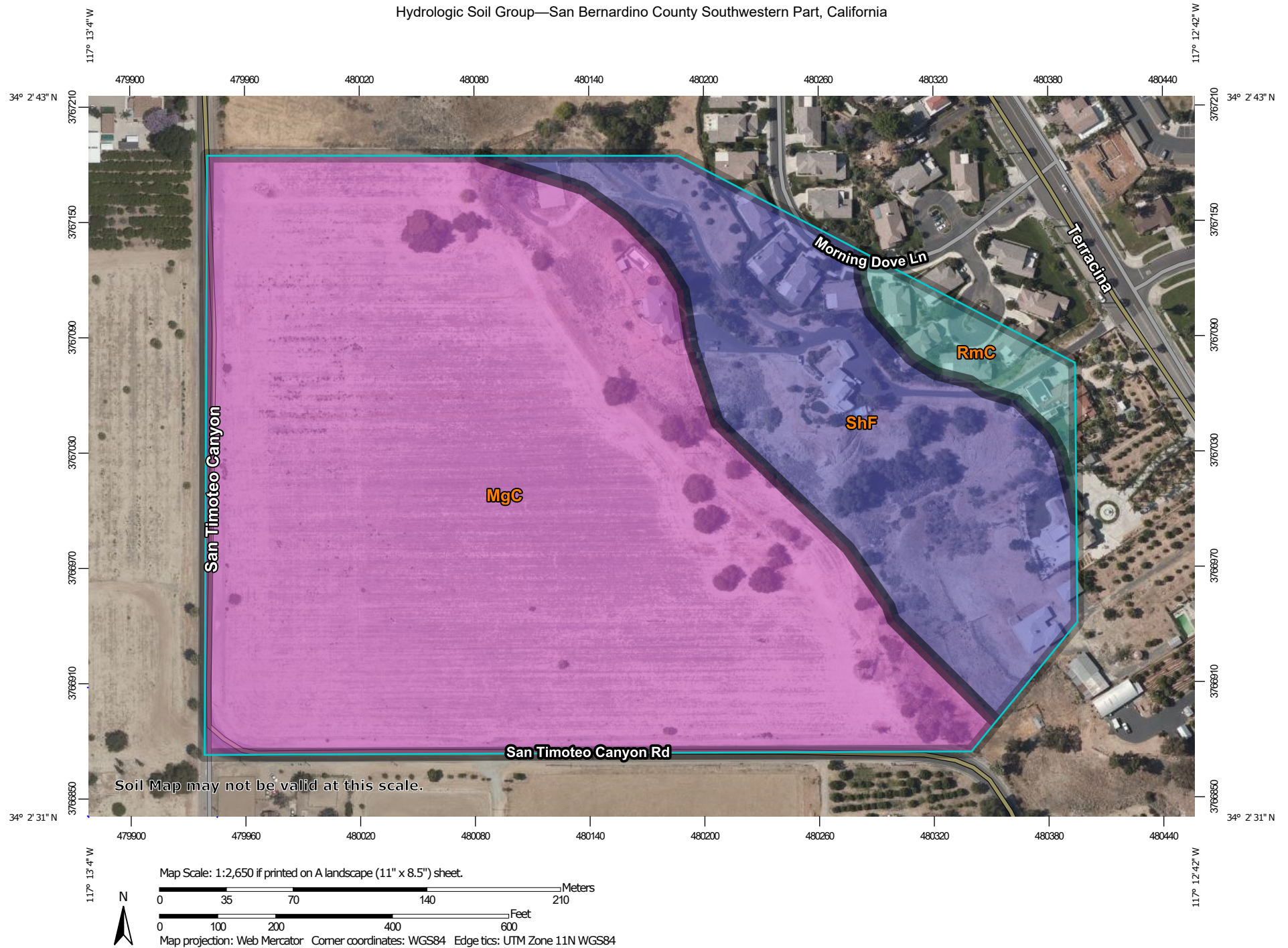
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HYDROLOGICAL SOILS GROUP MAP

Hydrologic Soil Group—San Bernardino County Southwestern Part, California



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points

 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Bernardino County Southwestern Part, California
 Survey Area Data: Version 12, May 27, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 1, 2018—Jun 30, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
MgC	Metz coarse sandy loam, 2 to 9 percent slopes	A	23.0	72.1%
RmC	Ramona sandy loam, 2 to 9 percent slopes, MLRA 19	C	1.1	3.5%
ShF	Saugus sandy loam, 30 to 50 percent slopes	B	7.8	24.4%
Totals for Area of Interest			31.9	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

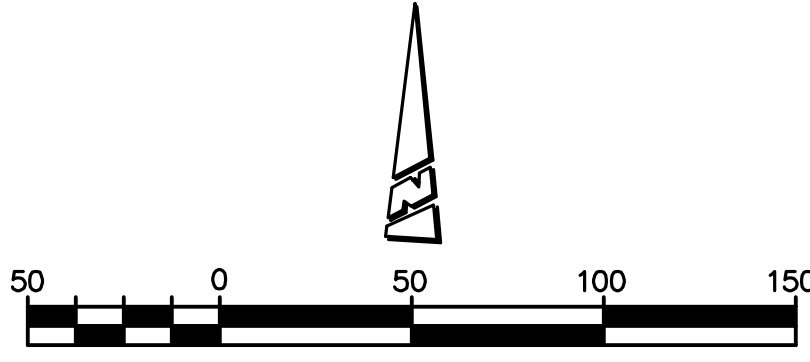
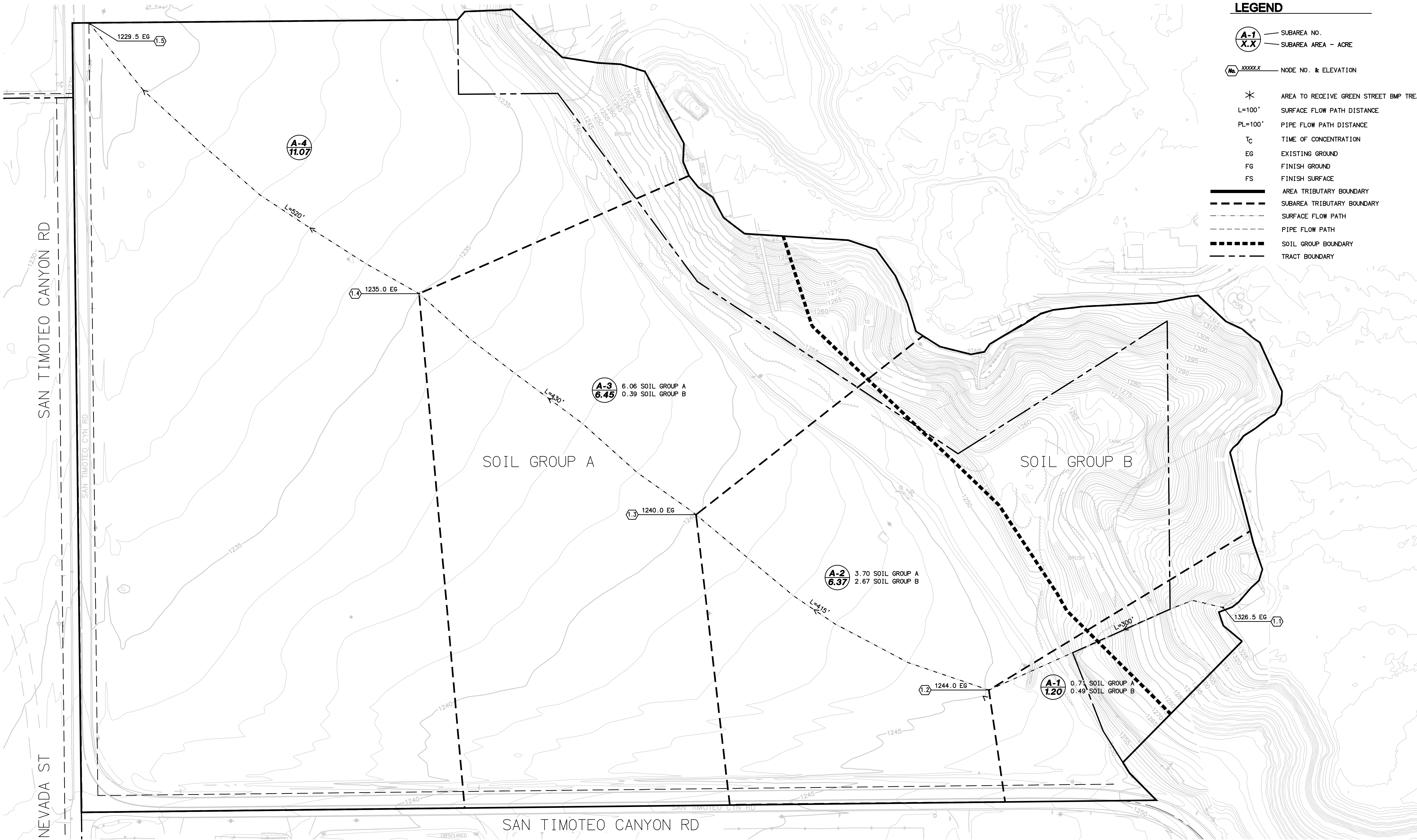
100-YEAR EXISTING HYDROLOGY (CALCULATIONS & MAP)

LEGEND

A-1 SUBAREA NO.
X.X SUBAREA AREA - ACRE

No. XXXXX.X NODE NO. & ELEVATION

- * AREA TO RECEIVE GREEN STREET BMP TREATMENT
- L=100' SURFACE FLOW PATH DISTANCE
- PL=100' PIPE FLOW PATH DISTANCE
- T_c TIME OF CONCENTRATION
- EG EXISTING GROUND
- FG FINISH GROUND
- FS FINISH SURFACE
- AREA TRIBUTARY BOUNDARY
- - - SUBAREA TRIBUTARY BOUNDARY
- . - . - SURFACE FLOW PATH
- - - - - PIPE FLOW PATH
- SOIL GROUP BOUNDARY
- - - - - TRACT BOUNDARY



SCALE: 1"=50'
DESIGN: CE
DRAWN: CE
CHECKED: SG
APPROVED:

PREPARED BY:
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CITY OF REDLANDS

TTM 20402
EXISTING HYDROLOGY MAP

SHEET NO.

1 OF 1

 RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
 (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
 (c) Copyright 1983-2015 Advanced Engineering Software (aes)
 Ver. 22.0 Release Date: 07/01/2015 License ID 1673

Analysis prepared by:

***** DESCRIPTION OF STUDY *****
 * TTM 20402 - EXISTING CONDITION *
 * 100 YEAR *
 * 05/09/2021 *

FILE NAME: 02EX100.DAT
 TIME/DATE OF STUDY: 18:48 05/09/2021

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

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

USER SPECIFIED STORM EVENT(YEAR) = 100.00
 SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00
 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
 USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.1100

ANTECEDENT MOISTURE CONDITION (AMC) III 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- / SIDE / SIDE / WAY	STREET-CROSSFALL: CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

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

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

*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

 FLOW PROCESS FROM NODE 1.10 TO NODE 1.20 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 300.00

ELEVATION DATA: UPSTREAM(FEET) = 1326.50 DOWNSTREAM(FEET) = 1245.00

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 6.671

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.147

SUBAREA T_c AND LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN	T_c (MIN.)
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NATURAL POOR COVER

"GRASS"	A	0.71	0.30	1.000	85	6.67
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NATURAL POOR COVER

"GRASS"	B	0.49	0.18	1.000	93	6.67
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SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 1.000

SUBAREA RUNOFF(CFS) = 4.21

TOTAL AREA(ACRES) = 1.20 PEAK FLOW RATE(CFS) = 4.21

FLOW PROCESS FROM NODE 1.20 TO NODE 1.30 IS CODE = 51

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

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1245.00 DOWNSTREAM(FEET) = 1240.00

CHANNEL LENGTH THRU SUBAREA(FEET) = 6.37 CHANNEL SLOPE = 0.7849

CHANNEL BASE(FEET) = 50.00 "Z" FACTOR = 5.000

MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 0.50

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.140

SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN
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NATURAL POOR COVER

"GRASS"	A	3.70	0.30	1.000	85
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NATURAL POOR COVER

"GRASS"	B	2.67	0.18	1.000	93
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SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 15.37

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.05

AVERAGE FLOW DEPTH(FEET) = 0.05 TRAVEL TIME(MIN.) = 0.02

T_c (MIN.) = 6.69

SUBAREA AREA(ACRES) = 6.37 SUBAREA RUNOFF(CFS) = 22.32

EFFECTIVE AREA(ACRES) = 7.57 AREA-AVERAGED F_m (INCH/HR) = 0.25

AREA-AVERAGED F_p (INCH/HR) = 0.25 AREA-AVERAGED A_p = 1.00

TOTAL AREA(ACRES) = 7.6 PEAK FLOW RATE(CFS) = 26.52

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.07 FLOW VELOCITY(FEET/SEC.) = 7.36

LONGEST FLOWPATH FROM NODE 1.10 TO NODE 1.30 = 306.37 FEET.

FLOW PROCESS FROM NODE 1.30 TO NODE 1.40 IS CODE = 51

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

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1240.00 DOWNSTREAM(FEET) = 1235.00

CHANNEL LENGTH THRU SUBAREA(FEET) = 430.00 CHANNEL SLOPE = 0.0116

CHANNEL BASE(FEET) = 50.00 "Z" FACTOR = 5.000

MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 0.50
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.299
 SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL POOR COVER					
"GRASS"	A	6.06	0.30	1.000	85
NATURAL POOR COVER					
"GRASS"	B	0.39	0.18	1.000	93

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.29
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 35.30
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.33
 AVERAGE FLOW DEPTH(FEET) = 0.29 TRAVEL TIME(MIN.) = 3.08
 Tc(MIN.) = 9.77
 SUBAREA AREA(ACRES) = 6.45 SUBAREA RUNOFF(CFS) = 17.47
 EFFECTIVE AREA(ACRES) = 14.02 AREA-AVERAGED Fm(INCH/HR) = 0.27
 AREA-AVERAGED Fp(INCH/HR) = 0.27 AREA-AVERAGED Ap = 1.00
 TOTAL AREA(ACRES) = 14.0 PEAK FLOW RATE(CFS) = 38.26

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 0.31 FLOW VELOCITY(FEET/SEC.) = 2.39
 LONGEST FLOWPATH FROM NODE 1.10 TO NODE 1.40 = 736.37 FEET.

 FLOW PROCESS FROM NODE 1.40 TO NODE 1.50 IS CODE = 51

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

ELEVATION DATA: UPSTREAM(FEET) = 1235.00 DOWNSTREAM(FEET) = 1229.50
 CHANNEL LENGTH THRU SUBAREA(FEET) = 520.00 CHANNEL SLOPE = 0.0106
 CHANNEL BASE(FEET) = 50.00 "Z" FACTOR = 5.000
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 0.50
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.764
 SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL POOR COVER					
"GRASS"	A	11.07	0.30	1.000	85

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 50.61
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.59
 AVERAGE FLOW DEPTH(FEET) = 0.38 TRAVEL TIME(MIN.) = 3.35
 Tc(MIN.) = 13.12
 SUBAREA AREA(ACRES) = 11.07 SUBAREA RUNOFF(CFS) = 24.59
 EFFECTIVE AREA(ACRES) = 25.09 AREA-AVERAGED Fm(INCH/HR) = 0.28
 AREA-AVERAGED Fp(INCH/HR) = 0.28 AREA-AVERAGED Ap = 1.00
 TOTAL AREA(ACRES) = 25.1 PEAK FLOW RATE(CFS) = 56.10

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) = 0.40 FLOW VELOCITY(FEET/SEC.) = 2.70
 LONGEST FLOWPATH FROM NODE 1.10 TO NODE 1.50 = 1256.37 FEET.

END OF STUDY SUMMARY:
 TOTAL AREA(ACRES) = 25.1 TC(MIN.) = 13.12
 EFFECTIVE AREA(ACRES) = 25.09 AREA-AVERAGED Fm(INCH/HR) = 0.28
 AREA-AVERAGED Fp(INCH/HR) = 0.28 AREA-AVERAGED Ap = 1.000

PEAK FLOW RATE (CFS) = 56.10

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END OF RATIONAL METHOD ANALYSIS

FLOOD ROUTING ANALYSIS
USING COUNTY HYDROLOGY MANUAL OF SAN BERNARDINO(1986)
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Ver. 22.0 Release Date: 07/01/2015 License ID 1673

Analysis prepared by:

***** DESCRIPTION OF STUDY *****
* TTM 20402 - EXISTING CONDITION *
* 100 YEAR *
* 05/11/2021 *

FILE NAME: C:\Hyd\02EX100.FLD
TIME/DATE OF STUDY: 21:49 05/11/2021

FLOW PROCESS FROM NODE 1.10 TO NODE 1.50 IS CODE = 1

>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<
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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 25.100 ACRES
BASEFLOW = 0.000 CFS/SQUARE-MILE
*USER ENTERED "LAG" TIME = 0.175 HOURS
CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
VALLEY(DEVELOPED) S-GRAPH SELECTED
MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.280
LOW LOSS FRACTION = 0.313
HYDROGRAPH MODEL #1 SPECIFIED

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.30
SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.76
SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 1.11
SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 1.92
SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 2.69
SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 4.81

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
5-MINUTE FACTOR = 0.999
30-MINUTE FACTOR = 0.999
1-HOUR FACTOR = 0.999
3-HOUR FACTOR = 1.000
6-HOUR FACTOR = 1.000
24-HOUR FACTOR = 1.000

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 47.619

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES (CFS)
1	4.046	12.283
2	27.047	69.821
3	64.065	112.368
4	87.609	71.469
5	96.178	26.010
6	98.504	7.063
7	99.334	2.517
8	99.733	1.213
9	99.933	0.607
10	100.000	0.202

TOTAL SOIL-LOSS VOLUME (ACRE-FEET) =	2.9430
TOTAL STORM RUNOFF VOLUME (ACRE-FEET) =	7.1137

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2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

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HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS (CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME (HRS)	VOLUME (AF)	Q (CFS)	0.	12.5	25.0	37.5	50.0
0.083	0.0004	0.06	Q	.	.	.	.
0.167	0.0031	0.40	Q	.	.	.	.
0.250	0.0096	0.94	Q	.	.	.	.
0.333	0.0184	1.28	VQ	.	.	.	.
0.417	0.0282	1.41	VQ	.	.	.	.
0.500	0.0382	1.45	VQ	.	.	.	.
0.583	0.0483	1.47	VQ	.	.	.	.
0.667	0.0585	1.48	VQ	.	.	.	.
0.750	0.0687	1.49	VQ	.	.	.	.
0.833	0.0790	1.49	VQ	.	.	.	.
0.917	0.0893	1.50	VQ	.	.	.	.
1.000	0.0996	1.50	VQ	.	.	.	.
1.083	0.1100	1.51	VQ	.	.	.	.
1.167	0.1204	1.51	VQ	.	.	.	.
1.250	0.1308	1.52	VQ	.	.	.	.
1.333	0.1413	1.52	VQ	.	.	.	.
1.417	0.1518	1.53	VQ	.	.	.	.
1.500	0.1623	1.53	VQ	.	.	.	.
1.583	0.1729	1.54	VQ	.	.	.	.
1.667	0.1835	1.54	.Q	.	.	.	.
1.750	0.1942	1.55	.Q	.	.	.	.
1.833	0.2048	1.55	.Q	.	.	.	.
1.917	0.2156	1.56	.Q	.	.	.	.
2.000	0.2263	1.56	.Q	.	.	.	.
2.083	0.2371	1.57	.Q	.	.	.	.
2.167	0.2479	1.57	.Q	.	.	.	.
2.250	0.2588	1.58	.Q	.	.	.	.
2.333	0.2697	1.58	.Q	.	.	.	.
2.417	0.2806	1.59	.Q	.	.	.	.
2.500	0.2916	1.59	.Q	.	.	.	.
2.583	0.3026	1.60	.Q	.	.	.	.
2.667	0.3137	1.61	.Q	.	.	.	.
2.750	0.3248	1.61	.Q	.	.	.	.
2.833	0.3359	1.62	.Q	.	.	.	.
2.917	0.3471	1.62	.Q	.	.	.	.
3.000	0.3583	1.63	.QV	.	.	.	.
3.083	0.3696	1.63	.QV	.	.	.	.
3.167	0.3809	1.64	.QV	.	.	.	.
3.250	0.3922	1.65	.QV	.	.	.	.
3.333	0.4036	1.65	.QV	.	.	.	.
3.417	0.4150	1.66	.QV	.	.	.	.
3.500	0.4265	1.67	.QV	.	.	.	.
3.583	0.4380	1.67	.QV	.	.	.	.
3.667	0.4496	1.68	.QV	.	.	.	.
3.750	0.4612	1.68	.QV	.	.	.	.
3.833	0.4728	1.69	.QV	.	.	.	.
3.917	0.4845	1.70	.QV	.	.	.	.

4.000	0.4963	1.70	.QV	.	.	.	.
4.083	0.5080	1.71	.QV	.	.	.	.
4.167	0.5199	1.72	.QV	.	.	.	.
4.250	0.5318	1.73	.QV	.	.	.	.
4.333	0.5437	1.73	.Q V	.	.	.	.
4.417	0.5557	1.74	.Q V	.	.	.	.
4.500	0.5677	1.75	.Q V	.	.	.	.
4.583	0.5798	1.75	.Q V	.	.	.	.
4.667	0.5919	1.76	.Q V	.	.	.	.
4.750	0.6041	1.77	.Q V	.	.	.	.
4.833	0.6163	1.78	.Q V	.	.	.	.
4.917	0.6286	1.78	.Q V	.	.	.	.
5.000	0.6409	1.79	.Q V	.	.	.	.
5.083	0.6533	1.80	.Q V	.	.	.	.
5.167	0.6658	1.81	.Q V	.	.	.	.
5.250	0.6783	1.81	.Q V	.	.	.	.
5.333	0.6908	1.82	.Q V	.	.	.	.
5.417	0.7034	1.83	.Q V	.	.	.	.
5.500	0.7161	1.84	.Q V	.	.	.	.
5.583	0.7288	1.85	.Q V	.	.	.	.
5.667	0.7416	1.86	.Q V	.	.	.	.
5.750	0.7544	1.86	.Q V	.	.	.	.
5.833	0.7673	1.87	.Q V	.	.	.	.
5.917	0.7803	1.88	.Q V	.	.	.	.
6.000	0.7933	1.89	.Q V	.	.	.	.
6.083	0.8064	1.90	.Q V	.	.	.	.
6.167	0.8195	1.91	.Q V	.	.	.	.
6.250	0.8327	1.92	.Q V	.	.	.	.
6.333	0.8460	1.93	.Q V	.	.	.	.
6.417	0.8593	1.94	.Q V	.	.	.	.
6.500	0.8728	1.95	.Q V	.	.	.	.
6.583	0.8862	1.96	.Q V	.	.	.	.
6.667	0.8998	1.97	.Q V	.	.	.	.
6.750	0.9134	1.98	.Q V	.	.	.	.
6.833	0.9270	1.99	.Q V	.	.	.	.
6.917	0.9408	2.00	.Q V	.	.	.	.
7.000	0.9546	2.01	.Q V	.	.	.	.
7.083	0.9685	2.02	.Q V	.	.	.	.
7.167	0.9825	2.03	.Q V	.	.	.	.
7.250	0.9965	2.04	.Q V	.	.	.	.
7.333	1.0106	2.05	.Q V	.	.	.	.
7.417	1.0248	2.06	.Q V	.	.	.	.
7.500	1.0391	2.07	.Q V	.	.	.	.
7.583	1.0534	2.08	.Q V	.	.	.	.
7.667	1.0679	2.10	.Q V	.	.	.	.
7.750	1.0824	2.11	.Q V	.	.	.	.
7.833	1.0970	2.12	.Q V	.	.	.	.
7.917	1.1117	2.13	.Q V	.	.	.	.
8.000	1.1264	2.14	.Q V	.	.	.	.
8.083	1.1413	2.16	.Q V	.	.	.	.
8.167	1.1562	2.17	.Q V	.	.	.	.
8.250	1.1713	2.18	.Q V	.	.	.	.
8.333	1.1864	2.20	.Q V	.	.	.	.
8.417	1.2016	2.21	.Q V	.	.	.	.
8.500	1.2169	2.22	.Q V	.	.	.	.
8.583	1.2324	2.24	.Q V	.	.	.	.
8.667	1.2479	2.25	.Q V	.	.	.	.
8.750	1.2635	2.27	.Q V	.	.	.	.
8.833	1.2792	2.28	.Q V	.	.	.	.

8.917	1.2950	2.30	.Q	V	.	.	.
9.000	1.3109	2.31	.Q	V	.	.	.
9.083	1.3269	2.33	.Q	V	.	.	.
9.167	1.3431	2.34	.Q	V	.	.	.
9.250	1.3593	2.36	.Q	V	.	.	.
9.333	1.3757	2.38	.Q	V	.	.	.
9.417	1.3922	2.39	.Q	V	.	.	.
9.500	1.4087	2.41	.Q	V	.	.	.
9.583	1.4255	2.43	.Q	V	.	.	.
9.667	1.4423	2.44	.Q	V	.	.	.
9.750	1.4593	2.46	.Q	V	.	.	.
9.833	1.4763	2.48	.Q	V	.	.	.
9.917	1.4936	2.50	. Q	V	.	.	.
10.000	1.5109	2.52	. Q	V	.	.	.
10.083	1.5284	2.54	. Q	V	.	.	.
10.167	1.5460	2.56	. Q	V	.	.	.
10.250	1.5638	2.58	. Q	V	.	.	.
10.333	1.5817	2.60	. Q	V	.	.	.
10.417	1.5998	2.62	. Q	V	.	.	.
10.500	1.6180	2.64	. Q	V.	.	.	.
10.583	1.6363	2.67	. Q	V.	.	.	.
10.667	1.6549	2.69	. Q	V.	.	.	.
10.750	1.6736	2.71	. Q	V.	.	.	.
10.833	1.6924	2.74	. Q	V.	.	.	.
10.917	1.7114	2.76	. Q	V.	.	.	.
11.000	1.7306	2.79	. Q	V.	.	.	.
11.083	1.7500	2.81	. Q	V.	.	.	.
11.167	1.7696	2.84	. Q	V.	.	.	.
11.250	1.7893	2.87	. Q	V	.	.	.
11.333	1.8093	2.90	. Q	V	.	.	.
11.417	1.8294	2.92	. Q	V	.	.	.
11.500	1.8498	2.95	. Q	V	.	.	.
11.583	1.8703	2.99	. Q	V	.	.	.
11.667	1.8911	3.02	. Q	V	.	.	.
11.750	1.9121	3.05	. Q	V	.	.	.
11.833	1.9333	3.08	. Q	V	.	.	.
11.917	1.9548	3.12	. Q	V	.	.	.
12.000	1.9765	3.15	. Q	.V	.	.	.
12.083	1.9986	3.21	. Q	.V	.	.	.
12.167	2.0218	3.37	. Q	.V	.	.	.
12.250	2.0466	3.60	. Q	.V	.	.	.
12.333	2.0725	3.77	. Q	.V	.	.	.
12.417	2.0990	3.85	. Q	.V	.	.	.
12.500	2.1260	3.91	. Q	.V	.	.	.
12.583	2.1532	3.96	. Q	. V	.	.	.
12.667	2.1808	4.01	. Q	. V	.	.	.
12.750	2.2088	4.06	. Q	. V	.	.	.
12.833	2.2371	4.11	. Q	. V	.	.	.
12.917	2.2657	4.16	. Q	. V	.	.	.
13.000	2.2948	4.22	. Q	. V	.	.	.
13.083	2.3242	4.27	. Q	. V	.	.	.
13.167	2.3540	4.33	. Q	. V	.	.	.
13.250	2.3843	4.39	. Q	. V	.	.	.
13.333	2.4149	4.46	. Q	. V	.	.	.
13.417	2.4461	4.52	. Q	. V	.	.	.
13.500	2.4777	4.59	. Q	. V	.	.	.
13.583	2.5099	4.67	. Q	. V	.	.	.
13.667	2.5425	4.74	. Q	. V	.	.	.
13.750	2.5757	4.82	. Q	. V	.	.	.

13.833	2.6095	4.91	.	Q	.	V	.	.	.
13.917	2.6440	5.00	.	Q	.	V	.	.	.
14.000	2.6790	5.09	.	Q	.	V	.	.	.
14.083	2.7148	5.20	.	Q	.	V	.	.	.
14.167	2.7516	5.34	.	Q	.	V	.	.	.
14.250	2.7894	5.50	.	Q	.	V	.	.	.
14.333	2.8284	5.66	.	Q	.	V	.	.	.
14.417	2.8683	5.80	.	Q	.	V	.	.	.
14.500	2.9092	5.94	.	Q	.	V	.	.	.
14.583	2.9511	6.08	.	Q	.	V	.	.	.
14.667	2.9941	6.24	.	Q	.	V	.	.	.
14.750	3.0383	6.42	.	Q	.	V	.	.	.
14.833	3.0837	6.60	.	Q	.	V	.	.	.
14.917	3.1306	6.81	.	Q	.	V	.	.	.
15.000	3.1790	7.03	.	Q	.	V	.	.	.
15.083	3.2292	7.28	.	Q	.	V	.	.	.
15.167	3.2812	7.55	.	Q	.	V	.	.	.
15.250	3.3354	7.87	.	Q	.	V	.	.	.
15.333	3.3920	8.22	.	Q	.	V	.	.	.
15.417	3.4517	8.67	.	Q	.	V	.	.	.
15.500	3.5162	9.37	.	Q	.	V	.	.	.
15.583	3.5872	10.31	.	Q	.	V	.	.	.
15.667	3.6646	11.23	.	Q	.	V	.	.	.
15.750	3.7481	12.13	.	Q	.	V	.	.	.
15.833	3.8383	13.09	.	Q	.	V	.	.	.
15.917	3.9382	14.51	.	Q	.	V	.	.	.
16.000	4.0592	17.56	.	.	Q	V	.	.	.
16.083	4.2308	24.92	.	.	.	Q	V	.	.
16.167	4.5003	39.13	.	.	.	.	V	Q	.
16.250	4.8149	45.69	.	.	.	.	.	V	Q
16.333	5.0469	33.68	.	.	.	.	Q	V	.
16.417	5.1906	20.86	.	.	Q	.	.	V	.
16.500	5.2878	14.13	.	.	Q	.	.	V	.
16.583	5.3639	11.05	.	Q	.	.	.	V	.
16.667	5.4282	9.34	.	Q	.	.	.	V	.
16.750	5.4851	8.25	.	Q	.	.	.	V	.
16.833	5.5366	7.49	.	Q	.	.	.	V	.
16.917	5.5843	6.92	.	Q	.	.	.	V	.
17.000	5.6291	6.50	.	Q	.	.	.	V	.
17.083	5.6714	6.14	.	Q	.	.	.	V	.
17.167	5.7114	5.81	.	Q	.	.	.	V	.
17.250	5.7493	5.50	.	Q	.	.	.	V	.
17.333	5.7854	5.25	.	Q	.	.	.	V	.
17.417	5.8201	5.03	.	Q	.	.	.	V	.
17.500	5.8535	4.85	.	Q	.	.	.	V	.
17.583	5.8858	4.69	.	Q	.	.	.	V	.
17.667	5.9171	4.54	.	Q	.	.	.	V	.
17.750	5.9475	4.41	.	Q	.	.	.	V	.
17.833	5.9771	4.29	.	Q	.	.	.	V	.
17.917	6.0058	4.18	.	Q	.	.	.	V	.
18.000	6.0339	4.07	.	Q	.	.	.	V	.
18.083	6.0611	3.95	.	Q	.	.	.	V	.
18.167	6.0869	3.74	.	Q	.	.	.	V	.
18.250	6.1108	3.47	.	Q	.	.	.	V	.
18.333	6.1332	3.26	.	Q	.	.	.	V	.
18.417	6.1549	3.15	.	Q	.	.	.	V	.
18.500	6.1760	3.07	.	Q	.	.	.	V	.
18.583	6.1967	3.00	.	Q	.	.	.	V	.
18.667	6.2169	2.93	.	Q	.	.	.	V	.

18.750	6.2367	2.88	. Q	.	.	.	V	.
18.833	6.2561	2.82	. Q	.	.	.	V	.
18.917	6.2752	2.77	. Q	.	.	.	V	.
19.000	6.2939	2.72	. Q	.	.	.	V	.
19.083	6.3123	2.67	. Q	.	.	.	V	.
19.167	6.3304	2.63	. Q	.	.	.	V	.
19.250	6.3482	2.59	. Q	.	.	.	V	.
19.333	6.3657	2.54	. Q	.	.	.	V	.
19.417	6.3830	2.50	. Q	.	.	.	V	.
19.500	6.4000	2.47	.Q	.	.	.	V	.
19.583	6.4167	2.43	.Q	.	.	.	V	.
19.667	6.4332	2.40	.Q	.	.	.	V	.
19.750	6.4495	2.36	.Q	.	.	.	V	.
19.833	6.4655	2.33	.Q	.	.	.	V	.
19.917	6.4814	2.30	.Q	.	.	.	V	.
20.000	6.4970	2.27	.Q	.	.	.	V	.
20.083	6.5125	2.24	.Q	.	.	.	V	.
20.167	6.5277	2.21	.Q	.	.	.	V	.
20.250	6.5428	2.19	.Q	.	.	.	V	.
20.333	6.5576	2.16	.Q	.	.	.	V	.
20.417	6.5723	2.13	.Q	.	.	.	V	.
20.500	6.5869	2.11	.Q	.	.	.	V	.
20.583	6.6012	2.09	.Q	.	.	.	V	.
20.667	6.6155	2.06	.Q	.	.	.	V	.
20.750	6.6295	2.04	.Q	.	.	.	V	.
20.833	6.6434	2.02	.Q	.	.	.	V	.
20.917	6.6572	2.00	.Q	.	.	.	V	.
21.000	6.6708	1.98	.Q	.	.	.	V	.
21.083	6.6843	1.96	.Q	.	.	.	V	.
21.167	6.6977	1.94	.Q	.	.	.	V	.
21.250	6.7109	1.92	.Q	.	.	.	V	.
21.333	6.7240	1.90	.Q	.	.	.	V	.
21.417	6.7369	1.88	.Q	.	.	.	V	.
21.500	6.7498	1.87	.Q	.	.	.	V	.
21.583	6.7625	1.85	.Q	.	.	.	V	.
21.667	6.7752	1.83	.Q	.	.	.	V	.
21.750	6.7877	1.82	.Q	.	.	.	V	.
21.833	6.8001	1.80	.Q	.	.	.	V	.
21.917	6.8124	1.79	.Q	.	.	.	V	.
22.000	6.8246	1.77	.Q	.	.	.	V	.
22.083	6.8366	1.76	.Q	.	.	.	V	.
22.167	6.8486	1.74	.Q	.	.	.	V	.
22.250	6.8605	1.73	.Q	.	.	.	V	.
22.333	6.8723	1.71	.Q	.	.	.	V	.
22.417	6.8840	1.70	.Q	.	.	.	V	.
22.500	6.8956	1.69	.Q	.	.	.	V	.
22.583	6.9072	1.67	.Q	.	.	.	V	.
22.667	6.9186	1.66	.Q	.	.	.	V	.
22.750	6.9300	1.65	.Q	.	.	.	V	.
22.833	6.9412	1.64	.Q	.	.	.	V.	.
22.917	6.9524	1.62	.Q	.	.	.	V.	.
23.000	6.9635	1.61	.Q	.	.	.	V.	.
23.083	6.9745	1.60	.Q	.	.	.	V.	.
23.167	6.9855	1.59	.Q	.	.	.	V.	.
23.250	6.9964	1.58	.Q	.	.	.	V.	.
23.333	7.0072	1.57	.Q	.	.	.	V.	.
23.417	7.0179	1.56	.Q	.	.	.	V.	.
23.500	7.0285	1.55	.Q	.	.	.	V.	.
23.583	7.0391	1.54	.Q	.	.	.	V.	.

23.667	7.0496	1.53	.Q	.	.	.	V.
23.750	7.0601	1.52	.Q	.	.	.	V.
23.833	7.0705	1.51	.Q	.	.	.	V.
23.917	7.0808	1.50	.Q	.	.	.	V.
24.000	7.0910	1.49	.Q	.	.	.	V.
24.083	7.1008	1.42	.Q	.	.	.	V.
24.167	7.1082	1.08	Q	.	.	.	V.
24.250	7.1118	0.53	Q	.	.	.	V.
24.333	7.1131	0.18	Q	.	.	.	V.
24.417	7.1135	0.06	Q	.	.	.	V.
24.500	7.1136	0.02	Q	.	.	.	V.
24.583	7.1137	0.01	Q	.	.	.	V.

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%	1475.0
10%	250.0
20%	75.0
30%	40.0
40%	25.0
50%	20.0
60%	15.0
70%	15.0
80%	10.0
90%	5.0

=====

END OF FLOODSCx ROUTING ANALYSIS

APPENDIX B – PROPOSED HYDROLOGY ANALYSIS (RATIONAL METHOD)

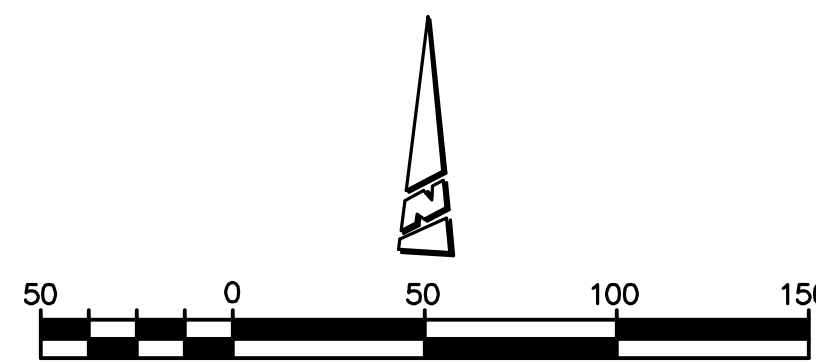
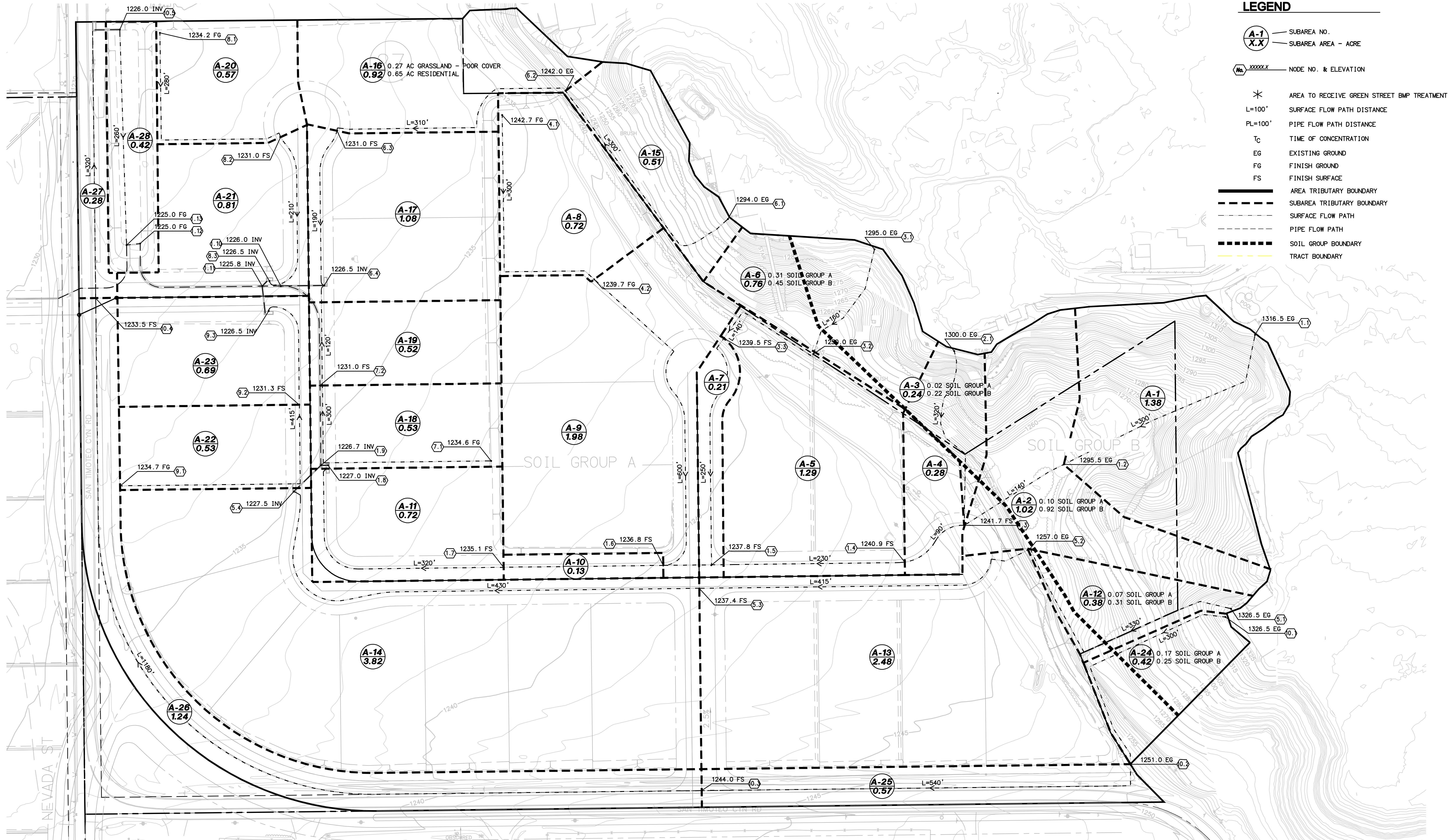
100-YEAR PROPOSED HYDROLOGY (CALCULATIONS & MAP)

LEGEND

A-1 SUBAREA NO.
X.X SUBAREA AREA - ACRE

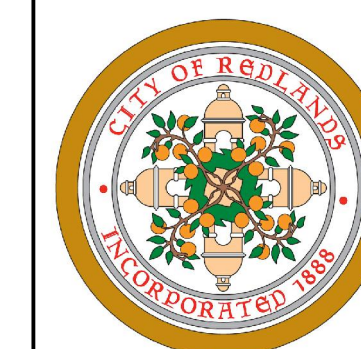
No. XXXXX.X NODE NO. & ELEVATION

* AREA TO RECEIVE GREEN STREET BMP TREATMENT
 L=100' SURFACE FLOW PATH DISTANCE
 PL=100' PIPE FLOW PATH DISTANCE
 T_C TIME OF CONCENTRATION
 EG EXISTING GROUND
 FG FINISH GROUND
 FS FINISH SURFACE
 — AREA TRIBUTARY BOUNDARY
 - - - SUBAREA TRIBUTARY BOUNDARY
 - - - SURFACE FLOW PATH
 - - - PIPE FLOW PATH
 - - - SOIL GROUP BOUNDARY
 - - - TRACT BOUNDARY



SCALE: 1"=50'
 DESIGN: CE
 DRAWN: CE
 CHECKED: SG
 APPROVED:

PREPARED BY:
PROACTIVE
 ENGINEERING CONSULTANTS
 WWW.PROACTIVEENGINEERING.NET
 200 South Main Street, Corona, CA 92882 Suite 300
 951-280-3300



CITY OF REDLANDS

TTM 20402
 PROPOSED HYDROLOGY MAP

SHEET NO.

1 OF 1

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2015 Advanced Engineering Software (aes)
Ver. 22.0 Release Date: 07/01/2015 License ID 1673

Analysis prepared by:

***** DESCRIPTION OF STUDY *****
* TTM 20402 - PROPOSED CONDITION *
* 100 YEAR *
* 05/10/2021 *

FILE NAME: C:\HYD\02PR100.DAT
TIME/DATE OF STUDY: 12:26 05/10/2021

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

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

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.1100

ANTECEDENT MOISTURE CONDITION (AMC) III 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- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES: LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

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

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

*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

FLOW PROCESS FROM NODE 1.10 TO NODE 1.20 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 300.00

ELEVATION DATA: UPSTREAM(FEET) = 1316.50 DOWNSTREAM(FEET) = 1295.50

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 8.750

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.524

SUBAREA T_c AND LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN	T_c (MIN.)
-------------------------------	-------------------	-----------------	--------------------	--------------------	-----------	-----------------

NATURAL POOR COVER

"GRASS"	B	1.38	0.18	1.000	93	8.75
---------	---	------	------	-------	----	------

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.18

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 1.000

SUBAREA RUNOFF(CFS) = 4.15

TOTAL AREA(ACRES) = 1.38 PEAK FLOW RATE(CFS) = 4.15

FLOW PROCESS FROM NODE 1.20 TO NODE 1.30 IS CODE = 51

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

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1295.50 DOWNSTREAM(FEET) = 1241.70

CHANNEL LENGTH THRU SUBAREA(FEET) = 140.00 CHANNEL SLOPE = 0.3843

CHANNEL BASE(FEET) = 50.00 "Z" FACTOR = 5.000

MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 0.50

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.357

SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN
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NATURAL POOR COVER

"GRASS"	A	0.10	0.30	1.000	85
---------	---	------	------	-------	----

NATURAL POOR COVER

"GRASS"	B	0.92	0.18	1.000	93
---------	---	------	------	-------	----

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.19

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.61

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.17

AVERAGE FLOW DEPTH(FEET) = 0.04 TRAVEL TIME(MIN.) = 0.74

T_c (MIN.) = 9.49

SUBAREA AREA(ACRES) = 1.02 SUBAREA RUNOFF(CFS) = 2.91

EFFECTIVE AREA(ACRES) = 2.40 AREA-AVERAGED F_m (INCH/HR) = 0.18

AREA-AVERAGED F_p (INCH/HR) = 0.18 AREA-AVERAGED A_p = 1.00

TOTAL AREA(ACRES) = 2.4 PEAK FLOW RATE(CFS) = 6.85

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.04 FLOW VELOCITY(FEET/SEC.) = 3.33

LONGEST FLOWPATH FROM NODE 1.10 TO NODE 1.30 = 440.00 FEET.

FLOW PROCESS FROM NODE 1.30 TO NODE 1.30 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.) = 9.49

RAINFALL INTENSITY(INCH/HR) = 3.36

AREA-AVERAGED F_m (INCH/HR) = 0.18

AREA-AVERAGED F_p (INCH/HR) = 0.18

AREA-AVERAGED $A_p = 1.00$
 EFFECTIVE STREAM AREA(ACRES) = 2.40
 TOTAL STREAM AREA(ACRES) = 2.40
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 6.85

 FLOW PROCESS FROM NODE 2.10 TO NODE 1.30 IS CODE = 21

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

INITIAL SUBAREA FLOW-LENGTH(FEET) = 320.00
 ELEVATION DATA: UPSTREAM(FEET) = 1300.00 DOWNSTREAM(FEET) = 1241.70

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 7.415

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.892

SUBAREA T_c AND LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN	T_c (MIN.)
-------------------------------	-------------------	-----------------	--------------------	--------------------	-----------	-----------------

NATURAL POOR COVER

"GRASS"	A	0.02	0.30	1.000	85	7.42
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NATURAL POOR COVER

"GRASS"	B	0.22	0.18	1.000	93	7.42
---------	---	------	------	-------	----	------

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.19

SUBAREA AVERAGE PERVIOUS AREA FRACTION, $A_p = 1.000$

SUBAREA RUNOFF(CFS) = 0.80

TOTAL AREA(ACRES) = 0.24 PEAK FLOW RATE(CFS) = 0.80

 FLOW PROCESS FROM NODE 1.30 TO NODE 1.30 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.) = 7.42

RAINFALL INTENSITY(INCH/HR) = 3.89

AREA-AVERAGED F_m (INCH/HR) = 0.19

AREA-AVERAGED F_p (INCH/HR) = 0.19

AREA-AVERAGED $A_p = 1.00$

EFFECTIVE STREAM AREA(ACRES) = 0.24

TOTAL STREAM AREA(ACRES) = 0.24

PEAK FLOW RATE(CFS) AT CONFLUENCE = 0.80

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	T_c (MIN.)	Intensity (INCH/HR)	$F_p(F_m)$ (INCH/HR)	A_p	A_e (ACRES)	HEADWATER NODE
1	6.85	9.49	3.357	0.18(0.18)	1.00	2.4	1.10
2	0.80	7.42	3.892	0.19(0.19)	1.00	0.2	2.10

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	T_c (MIN.)	Intensity (INCH/HR)	$F_p(F_m)$ (INCH/HR)	A_p	A_e (ACRES)	HEADWATER NODE
1	7.06	7.42	3.892	0.19(0.19)	1.00	2.1	2.10

2 7.54 9.49 3.357 0.19(0.19) 1.00 2.6 1.10

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 7.54 Tc(MIN.) = 9.49
EFFECTIVE AREA(ACRES) = 2.64 AREA-AVERAGED Fm(INCH/HR) = 0.19
AREA-AVERAGED Fp(INCH/HR) = 0.19 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 2.6
LONGEST FLOWPATH FROM NODE 1.10 TO NODE 1.30 = 440.00 FEET.

FLOW PROCESS FROM NODE 1.30 TO NODE 1.40 IS CODE = 62

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

=====

UPSTREAM ELEVATION(FEET) = 1241.70 DOWNSTREAM ELEVATION(FEET) = 1240.90
STREET LENGTH(FEET) = 90.00 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) = 7.89
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.47
 HALFSTREET FLOOD WIDTH(FEET) = 17.30
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.75
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.30
 STREET FLOW TRAVEL TIME(MIN.) = 0.55 Tc(MIN.) = 10.03
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.246
 SUBAREA LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.28 0.74 0.600 52
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 0.28 SUBAREA RUNOFF(CFS) = 0.71
 EFFECTIVE AREA(ACRES) = 2.92 AREA-AVERAGED Fm(INCH/HR) = 0.21
 AREA-AVERAGED Fp(INCH/HR) = 0.22 AREA-AVERAGED Ap = 0.96
 TOTAL AREA(ACRES) = 2.9 PEAK FLOW RATE(CFS) = 7.98

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.47 HALFSTREET FLOOD WIDTH(FEET) = 17.38
FLOW VELOCITY(FEET/SEC.) = 2.76 DEPTH*VELOCITY(FT*FT/SEC.) = 1.30
LONGEST FLOWPATH FROM NODE 1.10 TO NODE 1.40 = 530.00 FEET.

FLOW PROCESS FROM NODE 1.40 TO NODE 1.50 IS CODE = 62

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

=====

UPSTREAM ELEVATION(FEET) = 1240.90 DOWNSTREAM ELEVATION(FEET) = 1237.80
STREET LENGTH(FEET) = 230.00 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) = 9.45
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.47
HALFSTREET FLOOD WIDTH(FEET) = 17.07
AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.38
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.58
STREET FLOW TRAVEL TIME(MIN.) = 1.13 Tc(MIN.) = 11.17
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.044

SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"2 DWELLINGS/ACRE"	A	1.29	0.74	0.700	52
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700					
SUBAREA AREA(ACRES) = 1.29 SUBAREA RUNOFF(CFS) = 2.93					
EFFECTIVE AREA(ACRES) = 4.21 AREA-AVERAGED Fm(INCH/HR) = 0.30					
AREA-AVERAGED Fp(INCH/HR) = 0.35 AREA-AVERAGED Ap = 0.88					
TOTAL AREA(ACRES) = 4.2 PEAK FLOW RATE(CFS) = 10.38					

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 17.77
FLOW VELOCITY(FEET/SEC.) = 3.44 DEPTH*VELOCITY(FT*FT/SEC.) = 1.65
LONGEST FLOWPATH FROM NODE 1.10 TO NODE 1.50 = 760.00 FEET.

FLOW PROCESS FROM NODE 1.50 TO NODE 1.50 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.) = 11.17
RAINFALL INTENSITY(INCH/HR) = 3.04
AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.35
AREA-AVERAGED Ap = 0.88
EFFECTIVE STREAM AREA(ACRES) = 4.21
TOTAL STREAM AREA(ACRES) = 4.21
PEAK FLOW RATE(CFS) AT CONFLUENCE = 10.38

FLOW PROCESS FROM NODE 3.10 TO NODE 3.20 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) = 160.00
ELEVATION DATA: UPSTREAM(FEET) = 1295.00 DOWNSTREAM(FEET) = 1250.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 5.152
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.842
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.)
NATURAL POOR COVER
"GRASS"                A         0.31     0.30     1.000     85     5.15
NATURAL POOR COVER
"GRASS"                B         0.45     0.18     1.000     93     5.15
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 3.16
TOTAL AREA(ACRES) = 0.76 PEAK FLOW RATE(CFS) = 3.16

*****
FLOW PROCESS FROM NODE 3.20 TO NODE 3.30 IS CODE = 92
=====
>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<
=====
UPSTREAM NODE ELEVATION(FEET) = 1250.00
DOWNSTREAM NODE ELEVATION(FEET) = 1239.50
CHANNEL LENGTH THRU SUBAREA(FEET) = 140.00
"V" GUTTER WIDTH(FEET) = 2.00 GUTTER HIKE(FEET) = 0.800
PAVEMENT LIP(FEET) = 0.200 MANNING'S N = .0150
PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.20000
MAXIMUM DEPTH(FEET) = 1.01
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.740
SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp      Ap      SCS
    LAND USE          GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL POOR COVER
"GRASS"                A         0.00     0.30     1.000     85
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.00
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.16
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.49
AVERAGE FLOW DEPTH(FEET) = 0.80 FLOOD WIDTH(FEET) = 2.00
"V" GUTTER FLOW TRAVEL TIME(MIN.) = 0.19 Tc(MIN.) = 5.34
SUBAREA AREA(ACRES) = 0.00 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 0.76 AREA-AVERAGED Fm(INCH/HR) = 0.23
AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 0.8 PEAK FLOW RATE(CFS) = 3.16
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

NOTE:TRAVEL TIME ESTIMATES BASED ON NORMAL DEPTH
      IN A FLOWING-FULL GUTTER(NORMAL DEPTH = GUTTER HIKE)

END OF SUBAREA "V" GUTTER HYDRAULICS:
DEPTH(FEET) = 0.80 FLOOD WIDTH(FEET) = 2.00
FLOW VELOCITY(FEET/SEC.) = 12.49 DEPTH*VELOCITY(FT*FT/SEC) = 9.99
LONGEST FLOWPATH FROM NODE 3.10 TO NODE 3.30 = 300.00 FEET.
*****

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FLOW PROCESS FROM NODE 3.30 TO NODE 1.50 IS CODE = 62

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

UPSTREAM ELEVATION(FEET) = 1239.50 DOWNSTREAM ELEVATION(FEET) = 1237.80
STREET LENGTH(FEET) = 250.00 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) = 3.52
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.39
HALFSTREET FLOOD WIDTH(FEET) = 13.01
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.06
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.82
STREET FLOW TRAVEL TIME(MIN.) = 2.02 Tc(MIN.) = 7.36
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.910
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL A 0.21 0.74 0.100 52
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA AREA(ACRES) = 0.21 SUBAREA RUNOFF(CFS) = 0.72
EFFECTIVE AREA(ACRES) = 0.97 AREA-AVERAGED Fm(INCH/HR) = 0.19
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 0.81
TOTAL AREA(ACRES) = 1.0 PEAK FLOW RATE(CFS) = 3.24

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.39 HALFSTREET FLOOD WIDTH(FEET) = 12.54
FLOW VELOCITY(FEET/SEC.) = 2.03 DEPTH*VELOCITY(FT*FT/SEC.) = 0.78
LONGEST FLOWPATH FROM NODE 3.10 TO NODE 1.50 = 550.00 FEET.

FLOW PROCESS FROM NODE 1.50 TO NODE 1.50 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:
TIME OF CONCENTRATION(MIN.) = 7.36
RAINFALL INTENSITY(INCH/HR) = 3.91
AREA-AVERAGED Fm(INCH/HR) = 0.19
AREA-AVERAGED Fp(INCH/HR) = 0.24
AREA-AVERAGED Ap = 0.81
EFFECTIVE STREAM AREA(ACRES) = 0.97
TOTAL STREAM AREA(ACRES) = 0.97
PEAK FLOW RATE(CFS) AT CONFLUENCE = 3.24

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10.35	9.10	3.441	0.37(0.32)	0.86	3.7	2.10
1	10.38	11.17	3.044	0.35(0.30)	0.88	4.2	1.10
2	3.24	7.36	3.910	0.24(0.19)	0.81	1.0	3.10

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	12.86	7.36	3.910	0.34(0.29)	0.85	3.9	3.10
2	13.18	9.10	3.441	0.35(0.30)	0.85	4.7	2.10
3	12.87	11.17	3.044	0.33(0.28)	0.87	5.2	1.10

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 13.18 Tc(MIN.) = 9.10
EFFECTIVE AREA(ACRES) = 4.66 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.35 AREA-AVERAGED Ap = 0.85
TOTAL AREA(ACRES) = 5.2
LONGEST FLOWPATH FROM NODE 1.10 TO NODE 1.50 = 760.00 FEET.

FLOW PROCESS FROM NODE 1.50 TO NODE 1.60 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 1237.80 DOWNSTREAM ELEVATION(FEET) = 1236.80
STREET LENGTH(FEET) = 60.00 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(curb-to-curb) = 0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 13.18
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.50
HALFSTREET FLOOD WIDTH(FEET) = 18.71
AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.97
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.97
STREET FLOW TRAVEL TIME(MIN.) = 0.25 Tc(MIN.) = 9.36
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.385
SUBAREA AREA(ACRES) = 0.00 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 4.66 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.35 AREA-AVERAGED Ap = 0.85
TOTAL AREA(ACRES) = 5.2 PEAK FLOW RATE(CFS) = 13.18
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.50 HALFSTREET FLOOD WIDTH(FEET) = 18.71

FLOW VELOCITY (FEET/SEC.) = 3.97 DEPTH*VELOCITY (FT*FT/SEC.) = 1.97
 LONGEST FLOWPATH FROM NODE 1.10 TO NODE 1.60 = 820.00 FEET.

 FLOW PROCESS FROM NODE 1.60 TO NODE 1.60 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.) =	9.36
RAINFALL INTENSITY (INCH/HR) =	3.39
AREA-AVERAGED F_m (INCH/HR) =	0.30
AREA-AVERAGED F_p (INCH/HR) =	0.35
AREA-AVERAGED A_p =	0.85
EFFECTIVE STREAM AREA (ACRES) =	4.66
TOTAL STREAM AREA (ACRES) =	5.18
PEAK FLOW RATE (CFS) AT CONFLUENCE =	13.18

 FLOW PROCESS FROM NODE 4.10 TO NODE 4.20 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH (FEET) =	300.00
ELEVATION DATA: UPSTREAM (FEET) =	1242.70
DOWNSTREAM (FEET) =	1239.70

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$						
SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) =	10.773					
* 100 YEAR RAINFALL INTENSITY (INCH/HR) =	3.110					
SUBAREA T_c AND LOSS RATE DATA (AMC III):						
DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN	T_c (MIN.)
RESIDENTIAL						
"2 DWELLINGS/ACRE"	A	0.72	0.74	0.700	52	10.77
SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.74						
SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.700						
SUBAREA RUNOFF (CFS) = 1.68						
TOTAL AREA (ACRES) = 0.72 PEAK FLOW RATE (CFS) = 1.68						

 FLOW PROCESS FROM NODE 4.20 TO NODE 1.60 IS CODE = 62

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

=====

UPSTREAM ELEVATION (FEET) =	1239.70
DOWNSTREAM ELEVATION (FEET) =	1236.80
STREET LENGTH (FEET) =	600.00
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 (curb-to-curb) =	0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =	0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.39
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.41
 HALFSTREET FLOOD WIDTH(FEET) = 13.79
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.79
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.73
 STREET FLOW TRAVEL TIME(MIN.) = 5.58 Tc(MIN.) = 16.36
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.421
 SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"2 DWELLINGS/ACRE"	A	1.98	0.74	0.700	52

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA(ACRES) = 1.98 SUBAREA RUNOFF(CFS) = 3.39
 EFFECTIVE AREA(ACRES) = 2.70 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 TOTAL AREA(ACRES) = 2.7 PEAK FLOW RATE(CFS) = 4.62

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.44 HALFSTREET FLOOD WIDTH(FEET) = 15.74
 FLOW VELOCITY(FEET/SEC.) = 1.92 DEPTH*VELOCITY(FT*FT/SEC.) = 0.85
 LONGEST FLOWPATH FROM NODE 4.10 TO NODE 1.60 = 900.00 FEET.

 FLOW PROCESS FROM NODE 1.60 TO NODE 1.60 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.) = 16.36
 RAINFALL INTENSITY(INCH/HR) = 2.42
 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.74
 AREA-AVERAGED Ap = 0.70
 EFFECTIVE STREAM AREA(ACRES) = 2.70
 TOTAL STREAM AREA(ACRES) = 2.70
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 4.62

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12.86	7.61	3.831	0.34(0.29)	0.85	3.9	3.10
1	13.18	9.36	3.385	0.35(0.30)	0.85	4.7	2.10
1	12.87	11.42	3.003	0.33(0.28)	0.87	5.2	1.10
2	4.62	16.36	2.421	0.74(0.52)	0.70	2.7	4.10

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	16.61	7.61	3.831	0.42(0.35)	0.81	5.2	3.10
2	17.16	9.36	3.385	0.43(0.35)	0.81	6.2	2.10

3	17.08	11.42	3.003	0.42 (0.35)	0.82	7.1	1.10
4	14.73	16.36	2.421	0.45 (0.36)	0.81	7.9	4.10

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 17.16 Tc (MIN.) = 9.36
 EFFECTIVE AREA (ACRES) = 6.20 AREA-AVERAGED Fm (INCH/HR) = 0.35
 AREA-AVERAGED Fp (INCH/HR) = 0.43 AREA-AVERAGED Ap = 0.81
 TOTAL AREA (ACRES) = 7.9
 LONGEST FLOWPATH FROM NODE 4.10 TO NODE 1.60 = 900.00 FEET.

FLOW PROCESS FROM NODE 1.60 TO NODE 1.70 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<

UPSTREAM ELEVATION (FEET) = 1236.80 DOWNSTREAM ELEVATION (FEET) = 1235.10
 STREET LENGTH (FEET) = 190.00 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 (curb-to-curb) = 0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 17.35
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 0.58
 HALFSTREET FLOOD WIDTH (FEET) = 23.63
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.35
 PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 1.96
 STREET FLOW TRAVEL TIME (MIN.) = 0.95 Tc (MIN.) = 10.30
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.195

SUBAREA LOSS RATE DATA (AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	A	0.13	0.74	0.100	52
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.74					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100					
SUBAREA AREA (ACRES) = 0.13 SUBAREA RUNOFF (CFS) = 0.37					
EFFECTIVE AREA (ACRES) = 6.33 AREA-AVERAGED Fm (INCH/HR) = 0.35					
AREA-AVERAGED Fp (INCH/HR) = 0.43 AREA-AVERAGED Ap = 0.80					
TOTAL AREA (ACRES) = 8.0 PEAK FLOW RATE (CFS) = 17.16					

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH (FEET) = 0.58 HALFSTREET FLOOD WIDTH (FEET) = 23.55
 FLOW VELOCITY (FEET/SEC.) = 3.33 DEPTH*VELOCITY (FT*FT/SEC.) = 1.94
 LONGEST FLOWPATH FROM NODE 4.10 TO NODE 1.70 = 1090.00 FEET.

FLOW PROCESS FROM NODE 1.70 TO NODE 1.80 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<

```

=====
UPSTREAM ELEVATION(FEET) = 1235.10  DOWNSTREAM ELEVATION(FEET) = 1227.00
STREET LENGTH(FEET) = 320.00  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) = 17.97
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.51
HALFSTREET FLOOD WIDTH(FEET) = 19.49
AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.01
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.56
STREET FLOW TRAVEL TIME(MIN.) = 1.06  Tc(MIN.) = 11.37
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.012
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS
LAND USE              GROUP  (ACRES)  (INCH/HR)  (DECIMAL)  CN
RESIDENTIAL
"2 DWELLINGS/ACRE"      A      0.72      0.74      0.700      52
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
SUBAREA AREA(ACRES) = 0.72  SUBAREA RUNOFF(CFS) = 1.62
EFFECTIVE AREA(ACRES) = 7.05  AREA-AVERAGED Fm(INCH/HR) = 0.36
AREA-AVERAGED Fp(INCH/HR) = 0.46  AREA-AVERAGED Ap = 0.79
TOTAL AREA(ACRES) = 8.7  PEAK FLOW RATE(CFS) = 17.16
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.51  HALFSTREET FLOOD WIDTH(FEET) = 19.18
FLOW VELOCITY(FEET/SEC.) = 4.93  DEPTH*VELOCITY(FT*FT/SEC.) = 2.49
LONGEST FLOWPATH FROM NODE 4.10 TO NODE 1.80 = 1410.00 FEET.

*****
FLOW PROCESS FROM NODE 1.80 TO NODE 1.90 IS CODE = 31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1227.00  DOWNSTREAM(FEET) = 1226.70
FLOW LENGTH(FEET) = 10.00  MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 14.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 11.43
ESTIMATED PIPE DIAMETER(INCH) = 18.00  NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 17.16
PIPE TRAVEL TIME(MIN.) = 0.01  Tc(MIN.) = 11.38
LONGEST FLOWPATH FROM NODE 4.10 TO NODE 1.90 = 1420.00 FEET.

*****
FLOW PROCESS FROM NODE 1.90 TO NODE 1.90 IS CODE = 1
-----
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

```

```

=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 11.38
RAINFALL INTENSITY(INCH/HR) = 3.01
AREA-AVERAGED Fm(INCH/HR) = 0.36
AREA-AVERAGED Fp(INCH/HR) = 0.46
AREA-AVERAGED Ap = 0.79
EFFECTIVE STREAM AREA(ACRES) = 7.05
TOTAL STREAM AREA(ACRES) = 8.73
PEAK FLOW RATE(CFS) AT CONFLUENCE = 17.16

*****
FLOW PROCESS FROM NODE 5.10 TO NODE 5.20 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) = 1326.50 DOWNSTREAM(FEET) = 1257.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.292
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.931
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.)
NATURAL POOR COVER
"GRASS"                A        0.07    0.30    1.000    85    7.29
NATURAL POOR COVER
"GRASS"                B        0.31    0.18    1.000    93    7.29
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 1.28
TOTAL AREA(ACRES) = 0.38 PEAK FLOW RATE(CFS) = 1.28

*****
FLOW PROCESS FROM NODE 5.20 TO NODE 5.30 IS CODE = 62
-----
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<
=====
UPSTREAM ELEVATION(FEET) = 1257.00 DOWNSTREAM ELEVATION(FEET) = 1237.40
STREET LENGTH(FEET) = 415.00 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) = 4.64
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.33
HALFSTREET FLOOD WIDTH(FEET) = 9.47

```

AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.66
 PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 1.55
 STREET FLOW TRAVEL TIME (MIN.) = 1.48 Tc (MIN.) = 8.78
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.518
 SUBAREA LOSS RATE DATA (AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"2 DWELLINGS/ACRE"	A	2.48	0.74	0.700	52

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA (ACRES) = 2.48 SUBAREA RUNOFF (CFS) = 6.69
 EFFECTIVE AREA (ACRES) = 2.86 AREA-AVERAGED Fm (INCH/HR) = 0.48
 AREA-AVERAGED Fp (INCH/HR) = 0.64 AREA-AVERAGED Ap = 0.74
 TOTAL AREA (ACRES) = 2.9 PEAK FLOW RATE (CFS) = 7.83

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.38 HALFSTREET FLOOD WIDTH (FEET) = 12.07
 FLOW VELOCITY (FEET/SEC.) = 5.24 DEPTH*VELOCITY (FT*FT/SEC.) = 1.98
 LONGEST FLOWPATH FROM NODE 5.10 TO NODE 5.30 = 745.00 FEET.

 FLOW PROCESS FROM NODE 5.30 TO NODE 5.40 IS CODE = 62

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

=====
 UPSTREAM ELEVATION (FEET) = 1237.40 DOWNSTREAM ELEVATION (FEET) = 1227.50
 STREET LENGTH (FEET) = 430.00 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 (curb-to-curb) = 0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 12.40
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 0.47
 HALFSTREET FLOOD WIDTH (FEET) = 17.07
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.44
 PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 2.07
 STREET FLOW TRAVEL TIME (MIN.) = 1.62 Tc (MIN.) = 10.39
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.178
 SUBAREA LOSS RATE DATA (AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"2 DWELLINGS/ACRE"	A	3.82	0.74	0.700	52

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA (ACRES) = 3.82 SUBAREA RUNOFF (CFS) = 9.14
 EFFECTIVE AREA (ACRES) = 6.68 AREA-AVERAGED Fm (INCH/HR) = 0.50
 AREA-AVERAGED Fp (INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.72
 TOTAL AREA (ACRES) = 6.7 PEAK FLOW RATE (CFS) = 16.09

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(Feet) = 0.50 HALFSTREET FLOOD WIDTH(Feet) = 19.02
 FLOW VELOCITY(Feet/Sec.) = 4.70 DEPTH*VELOCITY(FT*FT/SEC.) = 2.36
 LONGEST FLOWPATH FROM NODE 5.10 TO NODE 5.40 = 1175.00 FEET.

 FLOW PROCESS FROM NODE 5.40 TO NODE 1.90 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(Feet) = 1227.50 DOWNSTREAM(Feet) = 1226.70
 FLOW LENGTH(Feet) = 45.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 21.0 INCH PIPE IS 14.0 INCHES
 PIPE-FLOW VELOCITY(Feet/Sec.) = 9.47
 ESTIMATED PIPE DIAMETER(INCH) = 21.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 16.09
 PIPE TRAVEL TIME(MIN.) = 0.08 Tc(MIN.) = 10.47
 LONGEST FLOWPATH FROM NODE 5.10 TO NODE 1.90 = 1220.00 FEET.

 FLOW PROCESS FROM NODE 1.90 TO NODE 1.90 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.) = 10.47
 RAINFALL INTENSITY(INCH/HR) = 3.16
 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.70
 AREA-AVERAGED Ap = 0.72
 EFFECTIVE STREAM AREA(ACRES) = 6.68
 TOTAL STREAM AREA(ACRES) = 6.68
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 16.09

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16.61	9.65	3.322	0.46(0.36)	0.78	6.1	3.10
1	17.16	11.38	3.010	0.46(0.36)	0.79	7.1	2.10
1	17.08	13.45	2.723	0.45(0.36)	0.80	7.9	1.10
1	14.77	18.46	2.252	0.47(0.37)	0.79	8.7	4.10
2	16.09	10.47	3.164	0.70(0.50)	0.72	6.7	5.10

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	32.33	9.65	3.322	0.57(0.43)	0.75	12.2	3.10
2	32.97	10.47	3.164	0.58(0.43)	0.75	13.2	5.10
3	32.33	11.38	3.010	0.57(0.43)	0.75	13.7	2.10
4	30.51	13.45	2.723	0.56(0.42)	0.76	14.6	1.10
5	25.35	18.46	2.252	0.57(0.43)	0.76	15.4	4.10

```

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =      32.97      Tc(MIN.) =      10.47
EFFECTIVE AREA(ACRES) =      13.21      AREA-AVERAGED Fm(INCH/HR) =      0.43
AREA-AVERAGED Fp(INCH/HR) =      0.58      AREA-AVERAGED Ap =      0.75
TOTAL AREA(ACRES) =      15.4
LONGEST FLOWPATH FROM NODE      4.10 TO NODE      1.90 =      1420.00 FEET.

*****
FLOW PROCESS FROM NODE      1.90 TO NODE      1.10 IS CODE =      31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1226.70 DOWNSTREAM(FEET) = 1226.00
FLOW LENGTH(FEET) = 245.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 36.0 INCH PIPE IS 28.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.59
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 32.97
PIPE TRAVEL TIME(MIN.) = 0.73 Tc(MIN.) = 11.20
LONGEST FLOWPATH FROM NODE      4.10 TO NODE      1.10 =      1665.00 FEET.

*****
FLOW PROCESS FROM NODE      1.10 TO NODE      1.10 IS CODE =      10
-----
>>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
=====

*****
FLOW PROCESS FROM NODE      6.10 TO NODE      6.20 IS CODE =      21
-----
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 300.00
ELEVATION DATA: UPSTREAM(FEET) = 1294.00 DOWNSTREAM(FEET) = 1242.00

Tc = K*[ (LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.298
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.929
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.)
NATURAL POOR COVER
"GRASS"      A      0.51      0.30      1.000      85      7.30
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 1.67
TOTAL AREA(ACRES) = 0.51 PEAK FLOW RATE(CFS) = 1.67

*****
FLOW PROCESS FROM NODE      6.20 TO NODE      6.30 IS CODE =      92
-----
>>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
=====
UPSTREAM NODE ELEVATION(FEET) = 1242.00
DOWNSTREAM NODE ELEVATION(FEET) = 1231.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 310.00
"V" GUTTER WIDTH(FEET) = 2.00 GUTTER HIKE(FEET) = 0.800

```

PAVEMENT LIP (FEET) = 0.200 MANNING'S N = .0120
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.20000
 MAXIMUM DEPTH (FEET) = 1.01
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.781
 SUBAREA LOSS RATE DATA (AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL POOR COVER					
"GRASS"	A	0.27	0.30	1.000	85
RESIDENTIAL					
"1 DWELLING/ACRE"	A	0.65	0.74	0.800	52

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.59
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.859
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 3.02
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.74
 AVERAGE FLOW DEPTH (FEET) = 0.80 FLOOD WIDTH (FEET) = 2.00
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.48 Tc (MIN.) = 7.78
 SUBAREA AREA (ACRES) = 0.92 SUBAREA RUNOFF (CFS) = 2.71
 EFFECTIVE AREA (ACRES) = 1.43 AREA-AVERAGED Fm (INCH/HR) = 0.43
 AREA-AVERAGED Fp (INCH/HR) = 0.47 AREA-AVERAGED Ap = 0.91
 TOTAL AREA (ACRES) = 1.4 PEAK FLOW RATE (CFS) = 4.31

NOTE: TRAVEL TIME ESTIMATES BASED ON NORMAL DEPTH
 IN A FLOWING-FULL GUTTER (NORMAL DEPTH = GUTTER HIKE)

END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.80 FLOOD WIDTH (FEET) = 2.00
 FLOW VELOCITY (FEET/SEC.) = 10.74 DEPTH*VELOCITY (FT*FT/SEC) = 8.59
 LONGEST FLOWPATH FROM NODE 6.10 TO NODE 6.30 = 610.00 FEET.

 FLOW PROCESS FROM NODE 6.30 TO NODE 6.40 IS CODE = 62

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

UPSTREAM ELEVATION (FEET) = 1231.00 DOWNSTREAM ELEVATION (FEET) = 1226.50
 STREET LENGTH (FEET) = 190.00 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 (curb-to-curb) = 0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 5.79
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 0.38
 HALFSTREET FLOOD WIDTH (FEET) = 12.30
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.74
 PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 1.43
 STREET FLOW TRAVEL TIME (MIN.) = 0.85 Tc (MIN.) = 8.63
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.554
 SUBAREA LOSS RATE DATA (AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"2 DWELLINGS/ACRE"	A	1.08	0.74	0.700	52
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700					
SUBAREA AREA(ACRES) = 1.08 SUBAREA RUNOFF(CFS) = 2.95					
EFFECTIVE AREA(ACRES) = 2.51 AREA-AVERAGED Fm(INCH/HR) = 0.47					
AREA-AVERAGED Fp(INCH/HR) = 0.57 AREA-AVERAGED Ap = 0.82					
TOTAL AREA(ACRES) = 2.5 PEAK FLOW RATE(CFS) = 6.97					

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.40 HALFSTREET FLOOD WIDTH(FEET) = 13.32
 FLOW VELOCITY(FEET/SEC.) = 3.92 DEPTH*VELOCITY(FT*FT/SEC.) = 1.57
 LONGEST FLOWPATH FROM NODE 6.10 TO NODE 6.40 = 800.00 FEET.

 FLOW PROCESS FROM NODE 6.40 TO NODE 6.40 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.) = 8.63
 RAINFALL INTENSITY(INCH/HR) = 3.55
 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp(INCH/HR) = 0.57
 AREA-AVERAGED Ap = 0.82
 EFFECTIVE STREAM AREA(ACRES) = 2.51
 TOTAL STREAM AREA(ACRES) = 2.51
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 6.97

 FLOW PROCESS FROM NODE 7.10 TO NODE 7.20 IS CODE = 21

 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 =====
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 300.00
 ELEVATION DATA: UPSTREAM(FEET) = 1234.60 DOWNSTREAM(FEET) = 1231.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.387
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.179
 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.)
RESIDENTIAL						
"2 DWELLINGS/ACRE"	A	0.53	0.74	0.700	52	10.39
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74						
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700						
SUBAREA RUNOFF(CFS) = 1.27						
TOTAL AREA(ACRES) = 0.53 PEAK FLOW RATE(CFS) = 1.27						

 FLOW PROCESS FROM NODE 7.20 TO NODE 6.40 IS CODE = 62

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

=====

UPSTREAM ELEVATION(FEET) = 1231.00 DOWNSTREAM ELEVATION(FEET) = 1226.50
STREET LENGTH(FEET) = 120.00 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) = 1.87
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.27
HALFSTREET FLOOD WIDTH(FEET) = 6.03
AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.60
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.97
STREET FLOW TRAVEL TIME(MIN.) = 0.56 Tc(MIN.) = 10.94
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.081
SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"2 DWELLINGS/ACRE"	A	0.52	0.74	0.700	52

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
SUBAREA AREA(ACRES) = 0.52 SUBAREA RUNOFF(CFS) = 1.20
EFFECTIVE AREA(ACRES) = 1.05 AREA-AVERAGED Fm(INCH/HR) = 0.52
AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
TOTAL AREA(ACRES) = 1.0 PEAK FLOW RATE(CFS) = 2.42

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.29 HALFSTREET FLOOD WIDTH(FEET) = 7.09
FLOW VELOCITY(FEET/SEC.) = 3.76 DEPTH*VELOCITY(FT*FT/SEC.) = 1.09
LONGEST FLOWPATH FROM NODE 7.10 TO NODE 6.40 = 420.00 FEET.

FLOW PROCESS FROM NODE 6.40 TO NODE 6.40 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.) = 10.94
RAINFALL INTENSITY(INCH/HR) = 3.08
AREA-AVERAGED Fm(INCH/HR) = 0.52
AREA-AVERAGED Fp(INCH/HR) = 0.74
AREA-AVERAGED Ap = 0.70
EFFECTIVE STREAM AREA(ACRES) = 1.05
TOTAL STREAM AREA(ACRES) = 1.05
PEAK FLOW RATE(CFS) AT CONFLUENCE = 2.42

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
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1	6.97	8.63	3.554	0.57(0.47)	0.82	2.5	6.10
2	2.42	10.94	3.081	0.74(0.52)	0.70	1.0	7.10

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	9.23	8.63	3.554	0.61(0.48)	0.79	3.3	6.10
2	8.32	10.94	3.081	0.62(0.48)	0.78	3.6	7.10

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 9.23 Tc(MIN.) = 8.63
EFFECTIVE AREA(ACRES) = 3.34 AREA-AVERAGED Fm(INCH/HR) = 0.48
AREA-AVERAGED Fp(INCH/HR) = 0.61 AREA-AVERAGED Ap = 0.79
TOTAL AREA(ACRES) = 3.6
LONGEST FLOWPATH FROM NODE 6.10 TO NODE 6.40 = 800.00 FEET.

FLOW PROCESS FROM NODE 6.40 TO NODE 1.10 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 1226.50 DOWNSTREAM(FEET) = 1226.00
FLOW LENGTH(FEET) = 55.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 13.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.29
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 9.23
PIPE TRAVEL TIME(MIN.) = 0.15 Tc(MIN.) = 8.77
LONGEST FLOWPATH FROM NODE 6.10 TO NODE 1.10 = 855.00 FEET.

FLOW PROCESS FROM NODE 1.10 TO NODE 1.10 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	9.23	8.77	3.519	0.61(0.48)	0.79	3.3	6.10
2	8.32	11.09	3.057	0.62(0.48)	0.78	3.6	7.10

LONGEST FLOWPATH FROM NODE 6.10 TO NODE 1.10 = 855.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	32.33	10.38	3.180	0.57(0.43)	0.75	12.2	3.10
2	32.97	11.20	3.039	0.58(0.43)	0.75	13.2	5.10
3	32.33	12.11	2.899	0.57(0.43)	0.75	13.7	2.10
4	30.51	14.18	2.637	0.56(0.42)	0.76	14.6	1.10
5	25.35	19.23	2.197	0.57(0.43)	0.76	15.4	4.10

LONGEST FLOWPATH FROM NODE 4.10 TO NODE 1.10 = 1665.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
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NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE
1	39.90	8.77	3.519	0.58(0.44)	0.76	13.7
2	40.93	10.38	3.180	0.58(0.44)	0.76	15.7
3	41.20	11.09	3.057	0.58(0.44)	0.76	16.6
4	41.23	11.20	3.039	0.58(0.44)	0.76	16.8
5	40.14	12.11	2.899	0.58(0.44)	0.76	17.3
6	37.48	14.18	2.637	0.57(0.44)	0.77	18.2
7	30.89	19.23	2.197	0.58(0.44)	0.76	19.0
TOTAL AREA(ACRES) =			19.0			

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 41.23 Tc(MIN.) = 11.201
EFFECTIVE AREA(ACRES) = 16.77 AREA-AVERAGED Fm(INCH/HR) = 0.44
AREA-AVERAGED Fp(INCH/HR) = 0.58 AREA-AVERAGED Ap = 0.76
TOTAL AREA(ACRES) = 19.0
LONGEST FLOWPATH FROM NODE 4.10 TO NODE 1.10 = 1665.00 FEET.

FLOW PROCESS FROM NODE 1.10 TO NODE 1.11 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM(FEET) = 1226.00 DOWNSTREAM(FEET) = 1225.80
FLOW LENGTH(FEET) = 25.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 33.0 INCH PIPE IS 24.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 8.78
ESTIMATED PIPE DIAMETER(INCH) = 33.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 41.23
PIPE TRAVEL TIME(MIN.) = 0.05 Tc(MIN.) = 11.25
LONGEST FLOWPATH FROM NODE 4.10 TO NODE 1.11 = 1690.00 FEET.

FLOW PROCESS FROM NODE 1.11 TO NODE 1.11 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.) = 11.25
RAINFALL INTENSITY(INCH/HR) = 3.03
AREA-AVERAGED Fm(INCH/HR) = 0.44
AREA-AVERAGED Fp(INCH/HR) = 0.58
AREA-AVERAGED Ap = 0.76
EFFECTIVE STREAM AREA(ACRES) = 16.77
TOTAL STREAM AREA(ACRES) = 18.97
PEAK FLOW RATE(CFS) AT CONFLUENCE = 41.23

FLOW PROCESS FROM NODE 8.10 TO NODE 8.20 IS CODE = 21

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

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 280.00
ELEVATION DATA: UPSTREAM(FEET) = 1234.20 DOWNSTREAM(FEET) = 1231.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.203

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* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.213
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.)
RESIDENTIAL
"2 DWELLINGS/ACRE"      A         0.57      0.74      0.700      52      10.20
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
SUBAREA RUNOFF(CFS) = 1.38
TOTAL AREA(ACRES) = 0.57 PEAK FLOW RATE(CFS) = 1.38

*****
FLOW PROCESS FROM NODE      8.20 TO NODE      8.30 IS CODE = 62
-----
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION # 1 USED)<<<<<
=====
UPSTREAM ELEVATION(FEET) = 1231.00 DOWNSTREAM ELEVATION(FEET) = 1226.50
STREET LENGTH(FEET) = 210.00 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) = 2.29
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.31
HALFSTREET FLOOD WIDTH(FEET) = 8.09
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.94
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.90
STREET FLOW TRAVEL TIME(MIN.) = 1.19 Tc(MIN.) = 11.39
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.008
SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp      Ap      SCS
    LAND USE          GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"2 DWELLINGS/ACRE"      A         0.81      0.74      0.700      52
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
SUBAREA AREA(ACRES) = 0.81 SUBAREA RUNOFF(CFS) = 1.81
EFFECTIVE AREA(ACRES) = 1.38 AREA-AVERAGED Fm(INCH/HR) = 0.52
AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
TOTAL AREA(ACRES) = 1.4 PEAK FLOW RATE(CFS) = 3.09

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.33 HALFSTREET FLOOD WIDTH(FEET) = 9.41
FLOW VELOCITY(FEET/SEC.) = 3.14 DEPTH*VELOCITY(FT*FT/SEC.) = 1.04
LONGEST FLOWPATH FROM NODE      8.10 TO NODE      8.30 = 490.00 FEET.

*****
FLOW PROCESS FROM NODE      8.30 TO NODE      1.11 IS CODE = 31
-----
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<

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```

>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1226.50  DOWNSTREAM(FEET) = 1225.80
FLOW LENGTH(FEET) = 10.00  MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 4.1 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 10.17
ESTIMATED PIPE DIAMETER(INCH) = 18.00  NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 3.09
PIPE TRAVEL TIME(MIN.) = 0.02  Tc(MIN.) = 11.41
LONGEST FLOWPATH FROM NODE 8.10 TO NODE 1.11 = 500.00 FEET.

*****
FLOW PROCESS FROM NODE 1.11 TO NODE 1.11 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.) = 11.41
RAINFALL INTENSITY(INCH/HR) = 3.00
AREA-AVERAGED Fm(INCH/HR) = 0.52
AREA-AVERAGED Fp(INCH/HR) = 0.74
AREA-AVERAGED Ap = 0.70
EFFECTIVE STREAM AREA(ACRES) = 1.38
TOTAL STREAM AREA(ACRES) = 1.38
PEAK FLOW RATE(CFS) AT CONFLUENCE = 3.09

*****
FLOW PROCESS FROM NODE 9.10 TO NODE 9.20 IS CODE = 21
-----

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 300.00
ELEVATION DATA: UPSTREAM(FEET) = 1234.70  DOWNSTREAM(FEET) = 1231.30

Tc = K*[ (LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.506
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.157
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.)
RESIDENTIAL
"2 DWELLINGS/ACRE"      A        0.53      0.74      0.700      52  10.51
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
SUBAREA RUNOFF(CFS) = 1.26
TOTAL AREA(ACRES) = 0.53  PEAK FLOW RATE(CFS) = 1.26

*****
FLOW PROCESS FROM NODE 9.20 TO NODE 9.30 IS CODE = 62
-----

>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION # 1 USED)<<<<<
=====
UPSTREAM ELEVATION(FEET) = 1231.30  DOWNSTREAM ELEVATION(FEET) = 1226.50
STREET LENGTH(FEET) = 115.00  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 (curb-to-curb) = 0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2.05
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH (FEET) = 0.27
HALFSTREET FLOOD WIDTH (FEET) = 6.16
AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.85
PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 1.05
STREET FLOW TRAVEL TIME (MIN.) = 0.50 Tc (MIN.) = 11.00
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.071
SUBAREA LOSS RATE DATA (AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"2 DWELLINGS/ACRE" A 0.69 0.74 0.700 52
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.74
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
SUBAREA AREA (ACRES) = 0.69 SUBAREA RUNOFF (CFS) = 1.58
EFFECTIVE AREA (ACRES) = 1.22 AREA-AVERAGED Fm (INCH/HR) = 0.52
AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
TOTAL AREA (ACRES) = 1.2 PEAK FLOW RATE (CFS) = 2.80

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH (FEET) = 0.30 HALFSTREET FLOOD WIDTH (FEET) = 7.47
FLOW VELOCITY (FEET/SEC.) = 4.05 DEPTH*VELOCITY (FT*FT/SEC.) = 1.20
LONGEST FLOWPATH FROM NODE 9.10 TO NODE 9.30 = 415.00 FEET.

FLOW PROCESS FROM NODE 9.30 TO NODE 1.11 IS CODE = 31

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

=====

ELEVATION DATA: UPSTREAM (FEET) = 1226.50 DOWNSTREAM (FEET) = 1225.80
FLOW LENGTH (FEET) = 35.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER (INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 5.4 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) = 6.34
ESTIMATED PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW (CFS) = 2.80
PIPE TRAVEL TIME (MIN.) = 0.09 Tc (MIN.) = 11.10
LONGEST FLOWPATH FROM NODE 9.10 TO NODE 1.11 = 450.00 FEET.

FLOW PROCESS FROM NODE 1.11 TO NODE 1.11 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.) = 11.10
 RAINFALL INTENSITY(INCH/HR) = 3.06
 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.74
 AREA-AVERAGED Ap = 0.70
 EFFECTIVE STREAM AREA(ACRES) = 1.22
 TOTAL STREAM AREA(ACRES) = 1.22
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 2.80

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	39.90	8.82	3.507	0.58(0.44)	0.76	13.7	6.10
1	40.93	10.43	3.171	0.58(0.44)	0.76	15.7	3.10
1	41.20	11.14	3.049	0.58(0.44)	0.76	16.6	7.10
1	41.23	11.25	3.031	0.58(0.44)	0.76	16.8	5.10
1	40.14	12.16	2.892	0.58(0.44)	0.76	17.3	2.10
1	37.48	14.23	2.632	0.57(0.44)	0.77	18.2	1.10
1	30.89	19.28	2.193	0.58(0.44)	0.76	19.0	4.10
2	3.09	11.41	3.005	0.74(0.52)	0.70	1.4	8.10
3	2.80	11.10	3.056	0.74(0.52)	0.70	1.2	9.10

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	45.40	8.82	3.507	0.60(0.45)	0.75	15.7	6.10
2	46.69	10.43	3.171	0.60(0.45)	0.75	18.1	3.10
3	47.05	11.10	3.056	0.60(0.45)	0.75	19.1	9.10
4	47.07	11.14	3.049	0.60(0.45)	0.75	19.2	7.10
5	47.08	11.25	3.031	0.60(0.45)	0.75	19.3	5.10
6	46.87	11.41	3.005	0.60(0.45)	0.75	19.5	8.10
7	45.71	12.16	2.892	0.60(0.45)	0.75	19.9	2.10
8	42.44	14.23	2.632	0.59(0.45)	0.76	20.8	1.10
9	34.82	19.28	2.193	0.59(0.45)	0.76	21.6	4.10

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 47.08 Tc(MIN.) = 11.25
 EFFECTIVE AREA(ACRES) = 19.35 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.75
 TOTAL AREA(ACRES) = 21.6
 LONGEST FLOWPATH FROM NODE 4.10 TO NODE 1.11 = 1690.00 FEET.

 FLOW PROCESS FROM NODE 1.11 TO NODE 1.12 IS CODE = 31

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

=====
 ELEVATION DATA: UPSTREAM(FEET) = 1225.80 DOWNSTREAM(FEET) = 1225.20
 FLOW LENGTH(FEET) = 190.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 42.0 INCH PIPE IS 29.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.44
 ESTIMATED PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 47.08
 PIPE TRAVEL TIME(MIN.) = 0.49 Tc(MIN.) = 11.74
 LONGEST FLOWPATH FROM NODE 4.10 TO NODE 1.12 = 1880.00 FEET.

```

*****
FLOW PROCESS FROM NODE      1.12 TO NODE      1.13 IS CODE =   51
-----
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) =   1225.20  DOWNSTREAM(FEET) =   1225.00
CHANNEL LENGTH THRU SUBAREA(FEET) =    20.00  CHANNEL SLOPE =   0.0100
CHANNEL BASE(FEET) =    50.00  "Z" FACTOR =    5.000
MANNING'S FACTOR = 0.030  MAXIMUM DEPTH(FEET) =    0.50
CHANNEL FLOW THRU SUBAREA(CFS) =    47.08
FLOW VELOCITY(FEET/SEC.) =    2.46  FLOW DEPTH(FEET) =    0.37
TRAVEL TIME(MIN.) =    0.14  Tc(MIN.) =   11.88
LONGEST FLOWPATH FROM NODE      4.10 TO NODE      1.13 =   1900.00 FEET.

*****
FLOW PROCESS FROM NODE      1.13 TO NODE      1.13 IS CODE =    1
-----
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
=====
TOTAL NUMBER OF STREAMS =    2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM    1 ARE:
TIME OF CONCENTRATION(MIN.) =   11.88
RAINFALL INTENSITY(INCH/HR) =    2.93
AREA-AVERAGED Fm(INCH/HR) =    0.45
AREA-AVERAGED Fp(INCH/HR) =    0.60
AREA-AVERAGED Ap =    0.75
EFFECTIVE STREAM AREA(ACRES) =    19.35
TOTAL STREAM AREA(ACRES) =    21.57
PEAK FLOW RATE(CFS) AT CONFLUENCE =    47.08

*****
FLOW PROCESS FROM NODE      10.10 TO NODE      10.20 IS CODE =   21
-----
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
=====
INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
ELEVATION DATA: UPSTREAM(FEET) =   1326.50  DOWNSTREAM(FEET) =   1251.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.774
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =    4.109
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.)
NATURAL POOR COVER
"GRASS"                A          0.17      0.30      1.000      85    6.77
NATURAL POOR COVER
"GRASS"                B          0.25      0.18      1.000      93    6.77
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =    0.23
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =    1.000
SUBAREA RUNOFF(CFS) =    1.47
TOTAL AREA(ACRES) =    0.42  PEAK FLOW RATE(CFS) =    1.47

*****
FLOW PROCESS FROM NODE      10.20 TO NODE      10.30 IS CODE =   62
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>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION # 1 USED)<<<<<
=====
UPSTREAM ELEVATION(FEET) = 1251.00  DOWNSTREAM ELEVATION(FEET) = 1244.00
STREET LENGTH(FEET) = 540.00  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) = 2.26
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.33
HALFSTREET FLOOD WIDTH(FEET) = 9.16
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.40
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.78
STREET FLOW TRAVEL TIME(MIN.) = 3.75  Tc(MIN.) = 10.53
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.154
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS
LAND USE              GROUP  (ACRES)  (INCH/HR)  (DECIMAL)  CN
COMMERCIAL            A      0.57      0.74      0.100      52
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA AREA(ACRES) = 0.57  SUBAREA RUNOFF(CFS) = 1.58
EFFECTIVE AREA(ACRES) = 0.99  AREA-AVERAGED Fm(INCH/HR) = 0.14
AREA-AVERAGED Fp(INCH/HR) = 0.29  AREA-AVERAGED Ap = 0.48
TOTAL AREA(ACRES) = 1.0  PEAK FLOW RATE(CFS) = 2.69

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.34  HALFSTREET FLOOD WIDTH(FEET) = 9.91
FLOW VELOCITY(FEET/SEC.) = 2.51  DEPTH*VELOCITY(FT*FT/SEC.) = 0.85
LONGEST FLOWPATH FROM NODE 10.10 TO NODE 10.30 = 840.00 FEET.

*****
FLOW PROCESS FROM NODE 10.30 TO NODE 10.40 IS CODE = 62
=====
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION # 1 USED)<<<<<
=====
UPSTREAM ELEVATION(FEET) = 1244.00  DOWNSTREAM ELEVATION(FEET) = 1233.50
STREET LENGTH(FEET) = 1180.00  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

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**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.89
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.39
 HALFSTREET FLOOD WIDTH(FEET) = 12.85
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.33
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.91
 STREET FLOW TRAVEL TIME(MIN.) = 8.43 Tc(MIN.) = 18.96
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.216
 SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	A	1.24	0.74	0.100	52

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 1.24 SUBAREA RUNOFF(CFS) = 2.39
 EFFECTIVE AREA(ACRES) = 2.23 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.38 AREA-AVERAGED Ap = 0.27
 TOTAL AREA(ACRES) = 2.2 PEAK FLOW RATE(CFS) = 4.24

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.40 HALFSTREET FLOOD WIDTH(FEET) = 13.32
 FLOW VELOCITY(FEET/SEC.) = 2.38 DEPTH*VELOCITY(FT*FT/SEC.) = 0.95
 LONGEST FLOWPATH FROM NODE 10.10 TO NODE 10.40 = 2020.00 FEET.

FLOW PROCESS FROM NODE 10.40 TO NODE 10.50 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 1233.50 DOWNSTREAM ELEVATION(FEET) = 1226.00
 STREET LENGTH(FEET) = 320.00 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) = 4.50
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.36
 HALFSTREET FLOOD WIDTH(FEET) = 10.98
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.54
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.27
 STREET FLOW TRAVEL TIME(MIN.) = 1.51 Tc(MIN.) = 20.46
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.117
 SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	A	0.28	0.74	0.100	52

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 0.28 SUBAREA RUNOFF(CFS) = 0.51
 EFFECTIVE AREA(ACRES) = 2.51 AREA-AVERAGED Fm(INCH/HR) = 0.10

AREA-AVERAGED F_p (INCH/HR) = 0.40 AREA-AVERAGED A_p = 0.25
TOTAL AREA (ACRES) = 2.5 PEAK FLOW RATE (CFS) = 4.56

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH (FEET) = 0.36 HALFSTREET FLOOD WIDTH (FEET) = 11.05
FLOW VELOCITY (FEET/SEC.) = 3.55 DEPTH*VELOCITY (FT*FT/SEC.) = 1.28
LONGEST FLOWPATH FROM NODE 10.10 TO NODE 10.50 = 2340.00 FEET.

FLOW PROCESS FROM NODE 10.50 TO NODE 1.13 IS CODE = 51

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

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM (FEET) = 1226.00 DOWNSTREAM (FEET) = 1225.00
CHANNEL LENGTH THRU SUBAREA (FEET) = 260.00 CHANNEL SLOPE = 0.0038
CHANNEL BASE (FEET) = 50.00 "Z" FACTOR = 5.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 0.50
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.828

SUBAREA LOSS RATE DATA (AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN
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NATURAL POOR COVER

"GRASS"	A	0.42	0.30	1.000	85
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SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 4.85

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 0.77

AVERAGE FLOW DEPTH (FEET) = 0.12 TRAVEL TIME (MIN.) = 5.66

T_c (MIN.) = 26.12

SUBAREA AREA (ACRES) = 0.42 SUBAREA RUNOFF (CFS) = 0.58

EFFECTIVE AREA (ACRES) = 2.93 AREA-AVERAGED F_m (INCH/HR) = 0.13

AREA-AVERAGED F_p (INCH/HR) = 0.36 AREA-AVERAGED A_p = 0.36

TOTAL AREA (ACRES) = 2.9 PEAK FLOW RATE (CFS) = 4.56

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 0.12 FLOW VELOCITY (FEET/SEC.) = 0.76

LONGEST FLOWPATH FROM NODE 10.10 TO NODE 1.13 = 2600.00 FEET.

FLOW PROCESS FROM NODE 1.13 TO NODE 1.13 IS CODE = 1

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

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

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION (MIN.) = 26.12

RAINFALL INTENSITY (INCH/HR) = 1.83

AREA-AVERAGED F_m (INCH/HR) = 0.13

AREA-AVERAGED F_p (INCH/HR) = 0.36

AREA-AVERAGED A_p = 0.36

EFFECTIVE STREAM AREA (ACRES) = 2.93

TOTAL STREAM AREA (ACRES) = 2.93

PEAK FLOW RATE (CFS) AT CONFLUENCE = 4.56

** CONFLUENCE DATA **

STREAM	Q	T_c	Intensity	F_p (F_m)	A_p	A_e	HEADWATER
--------	---	-------	-----------	-----------------	-------	-------	-----------

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	45.40	9.45	3.364	0.60 (0.45)	0.75	15.7	6.10
1	46.69	11.06	3.062	0.60 (0.45)	0.75	18.1	3.10
1	47.05	11.72	2.956	0.60 (0.45)	0.75	19.1	9.10
1	47.07	11.77	2.950	0.60 (0.45)	0.75	19.2	7.10
1	47.08	11.88	2.934	0.60 (0.45)	0.75	19.3	5.10
1	46.87	12.04	2.910	0.60 (0.45)	0.75	19.5	8.10
1	45.71	12.79	2.806	0.60 (0.45)	0.75	19.9	2.10
1	42.44	14.88	2.562	0.59 (0.45)	0.76	20.8	1.10
1	34.82	19.97	2.148	0.59 (0.45)	0.76	21.6	4.10
2	4.56	26.12	1.828	0.36 (0.13)	0.36	2.9	10.10

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	48.54	9.45	3.364	0.60 (0.43)	0.73	16.8	6.10
2	50.02	11.06	3.062	0.60 (0.43)	0.73	19.4	3.10
3	50.46	11.72	2.956	0.60 (0.43)	0.73	20.5	9.10
4	50.47	11.77	2.950	0.60 (0.43)	0.73	20.5	7.10
5	50.50	11.88	2.934	0.60 (0.43)	0.73	20.7	5.10
6	50.31	12.04	2.910	0.60 (0.43)	0.73	20.8	8.10
7	49.23	12.79	2.806	0.59 (0.43)	0.73	21.3	2.10
8	46.15	14.88	2.562	0.58 (0.42)	0.73	22.4	1.10
9	38.96	19.97	2.148	0.58 (0.42)	0.72	23.8	4.10
10	32.83	26.12	1.828	0.58 (0.41)	0.71	24.5	10.10

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 50.50 Tc (MIN.) = 11.88
EFFECTIVE AREA (ACRES) = 20.68 AREA-AVERAGED Fm (INCH/HR) = 0.43
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.73
TOTAL AREA (ACRES) = 24.5
LONGEST FLOWPATH FROM NODE 10.10 TO NODE 1.13 = 2600.00 FEET.

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 24.5 TC (MIN.) = 11.88
EFFECTIVE AREA (ACRES) = 20.68 AREA-AVERAGED Fm (INCH/HR) = 0.43
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.725
PEAK FLOW RATE (CFS) = 50.50

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	48.54	9.45	3.364	0.60 (0.43)	0.73	16.8	6.10
2	50.02	11.06	3.062	0.60 (0.43)	0.73	19.4	3.10
3	50.46	11.72	2.956	0.60 (0.43)	0.73	20.5	9.10
4	50.47	11.77	2.950	0.60 (0.43)	0.73	20.5	7.10
5	50.50	11.88	2.934	0.60 (0.43)	0.73	20.7	5.10
6	50.31	12.04	2.910	0.60 (0.43)	0.73	20.8	8.10
7	49.23	12.79	2.806	0.59 (0.43)	0.73	21.3	2.10
8	46.15	14.88	2.562	0.58 (0.42)	0.73	22.4	1.10
9	38.96	19.97	2.148	0.58 (0.42)	0.72	23.8	4.10
10	32.83	26.12	1.828	0.58 (0.41)	0.71	24.5	10.10

END OF RATIONAL METHOD ANALYSIS

FLOOD ROUTING ANALYSIS
USING COUNTY HYDROLOGY MANUAL OF SAN BERNARDINO(1986)
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Ver. 22.0 Release Date: 07/01/2015 License ID 1673

Analysis prepared by:

***** DESCRIPTION OF STUDY *****
* TTM 20402 - PROPOSED CONDITION *
* 100 YEAR *
* 05/11/2021 *

FILE NAME: C:\Hyd\02PR100.FLD
TIME/DATE OF STUDY: 21:41 05/11/2021

FLOW PROCESS FROM NODE 1.10 TO NODE 1.13 IS CODE = 1

>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<
=====

(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 24.500 ACRES
BASEFLOW = 0.000 CFS/SQUARE-MILE
*USER ENTERED "LAG" TIME = 0.158 HOURS
CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
VALLEY(DEVELOPED) S-GRAPH SELECTED
MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.408
LOW LOSS FRACTION = 0.477
HYDROGRAPH MODEL #1 SPECIFIED

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.30
SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.76
SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 1.11
SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 1.92
SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 2.69
SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 4.80

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
5-MINUTE FACTOR = 0.999
30-MINUTE FACTOR = 0.999
1-HOUR FACTOR = 0.999
3-HOUR FACTOR = 1.000
6-HOUR FACTOR = 1.000
24-HOUR FACTOR = 1.000

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 52.743

=====

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES (CFS)
1	4.940	14.637
2	32.812	82.584
3	72.256	116.872
4	91.868	58.109
5	97.717	17.331
6	99.032	3.897
7	99.613	1.720
8	99.903	0.860
9	100.000	0.287

TOTAL SOIL-LOSS VOLUME (ACRE-FEET) =	4.3521
TOTAL STORM RUNOFF VOLUME (ACRE-FEET) =	5.4446

=====

2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

=====

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS (CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME (HRS)	VOLUME (AF)	Q (CFS)	0.	12.5	25.0	37.5	50.0
0.083	0.0004	0.05	Q	.	.	.	.
0.167	0.0028	0.35	Q	.	.	.	.
0.250	0.0082	0.78	Q	.	.	.	.
0.333	0.0150	1.00	Q	.	.	.	.
0.417	0.0224	1.06	Q	.	.	.	.
0.500	0.0298	1.08	Q	.	.	.	.
0.583	0.0373	1.09	Q	.	.	.	.
0.667	0.0448	1.10	Q	.	.	.	.
0.750	0.0524	1.10	Q	.	.	.	.
0.833	0.0600	1.10	Q	.	.	.	.
0.917	0.0676	1.11	Q	.	.	.	.
1.000	0.0753	1.11	Q	.	.	.	.
1.083	0.0829	1.11	Q	.	.	.	.
1.167	0.0906	1.12	Q	.	.	.	.
1.250	0.0983	1.12	Q	.	.	.	.
1.333	0.1061	1.12	Q	.	.	.	.
1.417	0.1138	1.13	Q	.	.	.	.
1.500	0.1216	1.13	Q	.	.	.	.
1.583	0.1295	1.14	Q	.	.	.	.
1.667	0.1373	1.14	QV	.	.	.	.
1.750	0.1452	1.14	QV	.	.	.	.
1.833	0.1531	1.15	QV	.	.	.	.
1.917	0.1610	1.15	QV	.	.	.	.
2.000	0.1690	1.15	QV	.	.	.	.
2.083	0.1769	1.16	QV	.	.	.	.
2.167	0.1849	1.16	QV	.	.	.	.
2.250	0.1930	1.17	QV	.	.	.	.
2.333	0.2010	1.17	QV	.	.	.	.
2.417	0.2091	1.17	QV	.	.	.	.
2.500	0.2173	1.18	QV	.	.	.	.
2.583	0.2254	1.18	QV	.	.	.	.
2.667	0.2336	1.19	QV	.	.	.	.
2.750	0.2418	1.19	QV	.	.	.	.
2.833	0.2500	1.20	QV	.	.	.	.
2.917	0.2583	1.20	QV	.	.	.	.
3.000	0.2666	1.20	QV	.	.	.	.
3.083	0.2749	1.21	Q V	.	.	.	.
3.167	0.2833	1.21	Q V	.	.	.	.
3.250	0.2917	1.22	Q V	.	.	.	.
3.333	0.3001	1.22	Q V	.	.	.	.
3.417	0.3085	1.23	Q V	.	.	.	.
3.500	0.3170	1.23	Q V	.	.	.	.
3.583	0.3255	1.24	Q V	.	.	.	.
3.667	0.3341	1.24	Q V	.	.	.	.
3.750	0.3427	1.25	Q V	.	.	.	.
3.833	0.3513	1.25	.QV	.	.	.	.
3.917	0.3599	1.26	.QV	.	.	.	.

4.000	0.3686	1.26	.QV	.	.	.	.
4.083	0.3774	1.27	.QV	.	.	.	.
4.167	0.3861	1.27	.QV	.	.	.	.
4.250	0.3949	1.28	.QV	.	.	.	.
4.333	0.4037	1.28	.QV	.	.	.	.
4.417	0.4126	1.29	.Q V	.	.	.	.
4.500	0.4215	1.29	.Q V	.	.	.	.
4.583	0.4304	1.30	.Q V	.	.	.	.
4.667	0.4394	1.30	.Q V	.	.	.	.
4.750	0.4484	1.31	.Q V	.	.	.	.
4.833	0.4575	1.31	.Q V	.	.	.	.
4.917	0.4665	1.32	.Q V	.	.	.	.
5.000	0.4757	1.33	.Q V	.	.	.	.
5.083	0.4848	1.33	.Q V	.	.	.	.
5.167	0.4940	1.34	.Q V	.	.	.	.
5.250	0.5033	1.34	.Q V	.	.	.	.
5.333	0.5126	1.35	.Q V	.	.	.	.
5.417	0.5219	1.35	.Q V	.	.	.	.
5.500	0.5313	1.36	.Q V	.	.	.	.
5.583	0.5407	1.37	.Q V	.	.	.	.
5.667	0.5502	1.37	.Q V	.	.	.	.
5.750	0.5597	1.38	.Q V	.	.	.	.
5.833	0.5692	1.39	.Q V	.	.	.	.
5.917	0.5788	1.39	.Q V	.	.	.	.
6.000	0.5884	1.40	.Q V	.	.	.	.
6.083	0.5981	1.41	.Q V	.	.	.	.
6.167	0.6078	1.41	.Q V	.	.	.	.
6.250	0.6176	1.42	.Q V	.	.	.	.
6.333	0.6274	1.43	.Q V	.	.	.	.
6.417	0.6373	1.43	.Q V	.	.	.	.
6.500	0.6472	1.44	.Q V	.	.	.	.
6.583	0.6572	1.45	.Q V	.	.	.	.
6.667	0.6672	1.46	.Q V	.	.	.	.
6.750	0.6773	1.46	.Q V	.	.	.	.
6.833	0.6874	1.47	.Q V	.	.	.	.
6.917	0.6976	1.48	.Q V	.	.	.	.
7.000	0.7078	1.49	.Q V	.	.	.	.
7.083	0.7181	1.49	.Q V	.	.	.	.
7.167	0.7285	1.50	.Q V	.	.	.	.
7.250	0.7389	1.51	.Q V	.	.	.	.
7.333	0.7493	1.52	.Q V	.	.	.	.
7.417	0.7598	1.53	.Q V	.	.	.	.
7.500	0.7704	1.53	.Q V	.	.	.	.
7.583	0.7810	1.54	.Q V	.	.	.	.
7.667	0.7917	1.55	.Q V	.	.	.	.
7.750	0.8025	1.56	.Q V	.	.	.	.
7.833	0.8133	1.57	.Q V	.	.	.	.
7.917	0.8241	1.58	.Q V	.	.	.	.
8.000	0.8351	1.59	.Q V	.	.	.	.
8.083	0.8461	1.60	.Q V	.	.	.	.
8.167	0.8571	1.61	.Q V	.	.	.	.
8.250	0.8683	1.62	.Q V	.	.	.	.
8.333	0.8795	1.63	.Q V	.	.	.	.
8.417	0.8908	1.64	.Q V	.	.	.	.
8.500	0.9021	1.65	.Q V	.	.	.	.
8.583	0.9135	1.66	.Q V	.	.	.	.
8.667	0.9250	1.67	.Q V	.	.	.	.
8.750	0.9366	1.68	.Q V	.	.	.	.
8.833	0.9482	1.69	.Q V	.	.	.	.

8.917	0.9599	1.70	.Q	V	.	.	.
9.000	0.9717	1.71	.Q	V	.	.	.
9.083	0.9836	1.72	.Q	V	.	.	.
9.167	0.9955	1.74	.Q	V	.	.	.
9.250	1.0076	1.75	.Q	V	.	.	.
9.333	1.0197	1.76	.Q	V	.	.	.
9.417	1.0319	1.77	.Q	V	.	.	.
9.500	1.0442	1.79	.Q	V	.	.	.
9.583	1.0566	1.80	.Q	V	.	.	.
9.667	1.0691	1.81	.Q	V	.	.	.
9.750	1.0816	1.83	.Q	V	.	.	.
9.833	1.0943	1.84	.Q	V	.	.	.
9.917	1.1071	1.85	.Q	V	.	.	.
10.000	1.1199	1.87	.Q	V	.	.	.
10.083	1.1329	1.88	.Q	V	.	.	.
10.167	1.1459	1.90	.Q	V	.	.	.
10.250	1.1591	1.91	.Q	V	.	.	.
10.333	1.1724	1.93	.Q	V	.	.	.
10.417	1.1858	1.94	.Q	V	.	.	.
10.500	1.1993	1.96	.Q	V	.	.	.
10.583	1.2129	1.98	.Q	V	.	.	.
10.667	1.2266	1.99	.Q	V.	.	.	.
10.750	1.2405	2.01	.Q	V.	.	.	.
10.833	1.2545	2.03	.Q	V.	.	.	.
10.917	1.2686	2.05	.Q	V.	.	.	.
11.000	1.2828	2.07	.Q	V.	.	.	.
11.083	1.2972	2.09	.Q	V.	.	.	.
11.167	1.3117	2.11	.Q	V.	.	.	.
11.250	1.3263	2.13	.Q	V.	.	.	.
11.333	1.3411	2.15	.Q	V.	.	.	.
11.417	1.3561	2.17	.Q	V.	.	.	.
11.500	1.3712	2.19	.Q	V	.	.	.
11.583	1.3864	2.21	.Q	V	.	.	.
11.667	1.4018	2.24	.Q	V	.	.	.
11.750	1.4174	2.26	.Q	V	.	.	.
11.833	1.4332	2.29	.Q	V	.	.	.
11.917	1.4491	2.31	.Q	V	.	.	.
12.000	1.4652	2.34	.Q	V	.	.	.
12.083	1.4816	2.39	.Q	V	.	.	.
12.167	1.4990	2.53	. Q	.V	.	.	.
12.250	1.5177	2.71	. Q	.V	.	.	.
12.333	1.5371	2.82	. Q	.V	.	.	.
12.417	1.5569	2.88	. Q	.V	.	.	.
12.500	1.5770	2.91	. Q	.V	.	.	.
12.583	1.5973	2.95	. Q	.V	.	.	.
12.667	1.6179	2.99	. Q	.V	.	.	.
12.750	1.6387	3.02	. Q	. V	.	.	.
12.833	1.6598	3.06	. Q	. V	.	.	.
12.917	1.6811	3.10	. Q	. V	.	.	.
13.000	1.7028	3.14	. Q	. V	.	.	.
13.083	1.7247	3.18	. Q	. V	.	.	.
13.167	1.7469	3.23	. Q	. V	.	.	.
13.250	1.7695	3.27	. Q	. V	.	.	.
13.333	1.7923	3.32	. Q	. V	.	.	.
13.417	1.8156	3.37	. Q	. V	.	.	.
13.500	1.8392	3.42	. Q	. V	.	.	.
13.583	1.8631	3.48	. Q	. V	.	.	.
13.667	1.8875	3.54	. Q	. V	.	.	.
13.750	1.9122	3.60	. Q	. V	.	.	.

13.833	1.9374	3.66	. Q	.	V	.	.	.
13.917	1.9631	3.73	. Q	.	V	.	.	.
14.000	1.9893	3.80	. Q	.	V	.	.	.
14.083	2.0160	3.88	. Q	.	V	.	.	.
14.167	2.0435	3.99	. Q	.	V	.	.	.
14.250	2.0718	4.12	. Q	.	V	.	.	.
14.333	2.1009	4.23	. Q	.	V	.	.	.
14.417	2.1307	4.33	. Q	.	V	.	.	.
14.500	2.1613	4.43	. Q	.	V	.	.	.
14.583	2.1926	4.55	. Q	.	V	.	.	.
14.667	2.2247	4.66	. Q	.	V	.	.	.
14.750	2.2577	4.79	. Q	.	V	.	.	.
14.833	2.2917	4.94	. Q	.	V	.	.	.
14.917	2.3268	5.09	. Q	.	V	.	.	.
15.000	2.3630	5.26	. Q	.	V	.	.	.
15.083	2.4005	5.45	. Q	.	V	.	.	.
15.167	2.4395	5.66	. Q	.	V	.	.	.
15.250	2.4801	5.90	. Q	.	V	.	.	.
15.333	2.5225	6.17	. Q	.	V	.	.	.
15.417	2.5674	6.51	. Q	.	V	.	.	.
15.500	2.6162	7.09	. Q	.	V	.	.	.
15.583	2.6700	7.82	. Q	.	V	.	.	.
15.667	2.7285	8.49	. Q	.	V	.	.	.
15.750	2.7916	9.16	. Q	.	V	.	.	.
15.833	2.8598	9.91	. Q	.	V	.	.	.
15.917	2.9375	11.28	. Q	.	V	.	.	.
16.000	3.0385	14.66	. Q	.	V	.	.	.
16.083	3.1954	22.78	.	.	Q	V	.	.
16.167	3.4596	38.37	.	.	.	V	Q	.
16.250	3.7511	42.32	.	.	.	V	Q	.
16.333	3.9343	26.59	.	.	.Q	V	.	.
16.417	4.0373	14.96	. Q	.	.	V	.	.
16.500	4.1056	9.91	. Q	.	.	V	.	.
16.583	4.1599	7.89	. Q	.	.	V	.	.
16.667	4.2062	6.72	. Q	.	.	V	.	.
16.750	4.2471	5.95	. Q	.	.	.V	.	.
16.833	4.2845	5.42	. Q	.	.	.V	.	.
16.917	4.3193	5.06	. Q	.	.	.V	.	.
17.000	4.3521	4.76	. Q	.	.	.V	.	.
17.083	4.3831	4.51	. Q	.	.	. V	.	.
17.167	4.4125	4.27	. Q	.	.	. V	.	.
17.250	4.4403	4.04	. Q	.	.	. V	.	.
17.333	4.4669	3.86	. Q	.	.	. V	.	.
17.417	4.4924	3.71	. Q	.	.	. V	.	.
17.500	4.5171	3.58	. Q	.	.	. V	.	.
17.583	4.5409	3.46	. Q	.	.	. V	.	.
17.667	4.5640	3.35	. Q	.	.	. V	.	.
17.750	4.5864	3.26	. Q	.	.	. V	.	.
17.833	4.6082	3.17	. Q	.	.	. V	.	.
17.917	4.6295	3.09	. Q	.	.	. V	.	.
18.000	4.6502	3.01	. Q	.	.	. V	.	.
18.083	4.6703	2.92	. Q	.	.	. V	.	.
18.167	4.6892	2.74	. Q	.	.	. V	.	.
18.250	4.7066	2.52	. Q	.	.	. V	.	.
18.333	4.7230	2.39	.Q	.	.	. V	.	.
18.417	4.7390	2.31	.Q	.	.	. V	.	.
18.500	4.7545	2.26	.Q	.	.	. V	.	.
18.583	4.7697	2.21	.Q	.	.	. V	.	.
18.667	4.7846	2.16	.Q	.	.	. V	.	.

18.750	4.7992	2.12	.Q	.	.	.	V	.
18.833	4.8135	2.08	.Q	.	.	.	V	.
18.917	4.8276	2.04	.Q	.	.	.	V	.
19.000	4.8414	2.00	.Q	.	.	.	V	.
19.083	4.8549	1.97	.Q	.	.	.	V	.
19.167	4.8683	1.94	.Q	.	.	.	V	.
19.250	4.8814	1.91	.Q	.	.	.	V	.
19.333	4.8943	1.88	.Q	.	.	.	V	.
19.417	4.9070	1.85	.Q	.	.	.	V	.
19.500	4.9196	1.82	.Q	.	.	.	V	.
19.583	4.9319	1.79	.Q	.	.	.	V	.
19.667	4.9441	1.77	.Q	.	.	.	V	.
19.750	4.9561	1.74	.Q	.	.	.	V	.
19.833	4.9679	1.72	.Q	.	.	.	V	.
19.917	4.9796	1.70	.Q	.	.	.	V	.
20.000	4.9912	1.67	.Q	.	.	.	V	.
20.083	5.0025	1.65	.Q	.	.	.	V	.
20.167	5.0138	1.63	.Q	.	.	.	V	.
20.250	5.0249	1.61	.Q	.	.	.	V	.
20.333	5.0359	1.59	.Q	.	.	.	V	.
20.417	5.0467	1.57	.Q	.	.	.	V	.
20.500	5.0574	1.56	.Q	.	.	.	V	.
20.583	5.0680	1.54	.Q	.	.	.	V	.
20.667	5.0785	1.52	.Q	.	.	.	V	.
20.750	5.0889	1.51	.Q	.	.	.	V	.
20.833	5.0992	1.49	.Q	.	.	.	V	.
20.917	5.1093	1.47	.Q	.	.	.	V	.
21.000	5.1194	1.46	.Q	.	.	.	V	.
21.083	5.1293	1.44	.Q	.	.	.	V	.
21.167	5.1392	1.43	.Q	.	.	.	V	.
21.250	5.1489	1.42	.Q	.	.	.	V	.
21.333	5.1586	1.40	.Q	.	.	.	V	.
21.417	5.1682	1.39	.Q	.	.	.	V	.
21.500	5.1776	1.38	.Q	.	.	.	V	.
21.583	5.1870	1.36	.Q	.	.	.	V	.
21.667	5.1964	1.35	.Q	.	.	.	V	.
21.750	5.2056	1.34	.Q	.	.	.	V	.
21.833	5.2147	1.33	.Q	.	.	.	V	.
21.917	5.2238	1.32	.Q	.	.	.	V	.
22.000	5.2328	1.31	.Q	.	.	.	V	.
22.083	5.2417	1.30	.Q	.	.	.	V	.
22.167	5.2506	1.28	.Q	.	.	.	V	.
22.250	5.2593	1.27	.Q	.	.	.	V	.
22.333	5.2680	1.26	.Q	.	.	.	V	.
22.417	5.2767	1.25	.Q	.	.	.	V	.
22.500	5.2853	1.24	Q	.	.	.	V	.
22.583	5.2938	1.23	Q	.	.	.	V	.
22.667	5.3022	1.23	Q	.	.	.	V	.
22.750	5.3106	1.22	Q	.	.	.	V	.
22.833	5.3189	1.21	Q	.	.	.	V	.
22.917	5.3271	1.20	Q	.	.	.	V	.
23.000	5.3353	1.19	Q	.	.	.	V	.
23.083	5.3435	1.18	Q	.	.	.	V	.
23.167	5.3516	1.17	Q	.	.	.	V	.
23.250	5.3596	1.16	Q	.	.	.	V	.
23.333	5.3675	1.16	Q	.	.	.	V	.
23.417	5.3755	1.15	Q	.	.	.	V	.
23.500	5.3833	1.14	Q	.	.	.	V	.
23.583	5.3911	1.13	Q	.	.	.	V	.

23.667	5.3989	1.13	Q	.	.	.	V.
23.750	5.4066	1.12	Q	.	.	.	V.
23.833	5.4143	1.11	Q	.	.	.	V.
23.917	5.4219	1.10	Q	.	.	.	V.
24.000	5.4294	1.10	Q	.	.	.	V.
24.083	5.4366	1.04	Q	.	.	.	V.
24.167	5.4416	0.73	Q	.	.	.	V.
24.250	5.4437	0.30	Q	.	.	.	V.
24.333	5.4443	0.09	Q	.	.	.	V.
24.417	5.4445	0.02	Q	.	.	.	V.
24.500	5.4445	0.01	Q	.	.	.	V.
24.583	5.4446	0.00	Q	.	.	.	V.

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%	1475.0
10%	170.0
20%	55.0
30%	30.0
40%	20.0
50%	20.0
60%	15.0
70%	10.0
80%	10.0
90%	10.0

=====

END OF FLOODSCx ROUTING ANALYSIS

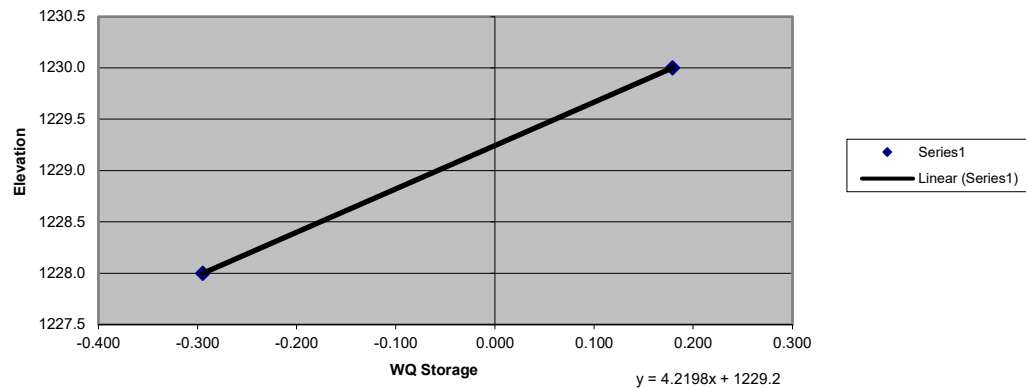
APPENDIX C – BASIN ROUTING

BASIN ‘A’

INFILTRATION Basin Storage Volumes*

Elevation	Surface Area	Surface Area (acres)	Surface Area (ft ³)	Depth	Volume (ft ³)	TTM 20402		Water Quality Volume (acre-ft)	Actual Storage (acre-ft)
						Accumulated Volume (ft ³)	Accumulated Volume (acre-ft)		
1225.0	5,478	0.126	5,478	0	0	0	0	0.61	-0.610
1226.0	6,619	0.152	6,619	1	2,419	2,419	0.056	0.61	-0.554
1227.0	7,813	0.179	7,813	2	2,886	5,306	0.122	0.61	-0.488
1228.0	9,039	0.208	9,039	3	8,426	13,732	0.315	0.61	-0.295
1229.0	10,314	0.237	10,314	4	9,677	23,408	0.537	0.61	-0.073
1229.3	10,706	0.246	10,706	4.3	3,153	26,561	0.610	0.61	0.000
1229.5	10,969	0.252	10,969	4.5	2,168	28,729	0.660	0.61	0.050
1229.8	11,360	0.261	11,360	4.8	3,349	32,078	0.736	0.61	0.126
1230.0	11,633	0.267	11,633	5	2,299	34,377	0.789	0.61	0.179

* Calculated using the Average End Area Method



1 acre = 43560 ft²

Routing Input Values - Basin II (West Basin)

Elevation	Depth (d)	Effective Head (d _o)***	Storage (acre-ft)	Q _{out} (cfs)	Flow Condition	
1229.3	0.0	N/A	0.000	0.0	N/A	Weir Formula: $Q_{out} = C_w * L * d^{1.5}$ where: C _w = 3.0 L = 6.00
1229.5	0.2	-0.16	0.050	1.6	Weir	
1229.8	0.5	0.14	0.126	6.4	Weir	Orifice Formula $Q_{out} = C_o * h * L * (2 * g * d_o)^{0.5}$ where: C _o = 0.67 L = 6.00
1230.0	0.7	0.34	0.179	10.5	Weir	h = 0.73 g = 32.2 d _o = d - (h/2) = Varies (see d _o Column)

* Per HEC-22 Inlet operates as a weir to depths equal to the opening height (height = 0.73')

** Per HEC-22 Inlet operated as an orifice at depths greater than 1.4 times the height of the opening (height = 0.73')

*** Required only for the Orifice Condition Calculation

F L O O D R O U T I N G A N A L Y S I S
USING COUNTY HYDROLOGY MANUAL OF SAN BERNARDINO(1986)
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Analysis prepared by:

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

* TTM 20402 - PROPOSED CONDITION *
* 100 YEAR *
* 05/12/2021 *

FILE NAME: 02BASIN.FLD
TIME/DATE OF STUDY: 19:58 05/12/2021

FLOW PROCESS FROM NODE 1.00 TO NODE 2.00 IS CODE = 1

>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
=====

(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 24.500 ACRES
BASEFLOW = 0.000 CFS/SQUARE-MILE
*USER ENTERED "LAG" TIME = 0.158 HOURS
 CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
 THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
 MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
VALLEY(DEVELOPED) S-GRAPH SELECTED
MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.408
LOW LOSS FRACTION = 0.477
HYDROGRAPH MODEL #1 SPECIFIED

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.30
SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.76
SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 1.11
SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 1.92
SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 2.69
SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 4.80

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:

5-MINUTE FACTOR = 0.999
 30-MINUTE FACTOR = 0.999
 1-HOUR FACTOR = 0.999
 3-HOUR FACTOR = 1.000
 6-HOUR FACTOR = 1.000
 24-HOUR FACTOR = 1.000

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 52.743

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	4.940	14.637
2	32.812	82.584
3	72.256	116.872
4	91.868	58.109
5	97.717	17.331
6	99.033	3.897
7	99.613	1.720
8	99.903	0.860
9	100.000	0.287

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 4.3521
 TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 5.4446

↑

24 - HOUR STORM
 RUNOFF HYDROGRAPH

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
 (Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	12.5	25.0	37.5	50.0
0.083	0.0004	0.05	Q	.	.	.	.
0.167	0.0028	0.35	Q	.	.	.	.

0.250	0.0082	0.78	Q	.	.	.	.
0.333	0.0150	1.00	Q	.	.	.	.
0.417	0.0224	1.06	Q	.	.	.	.
0.500	0.0298	1.08	Q	.	.	.	.
0.583	0.0373	1.09	Q	.	.	.	.
0.667	0.0448	1.10	Q	.	.	.	.
0.750	0.0524	1.10	Q	.	.	.	.
0.833	0.0600	1.10	Q	.	.	.	.
0.917	0.0676	1.11	Q	.	.	.	.
1.000	0.0753	1.11	Q	.	.	.	.
1.083	0.0829	1.11	Q	.	.	.	.
1.167	0.0906	1.12	Q	.	.	.	.
1.250	0.0983	1.12	Q	.	.	.	.
1.333	0.1061	1.12	Q	.	.	.	.
1.417	0.1138	1.13	Q	.	.	.	.
1.500	0.1216	1.13	Q	.	.	.	.
1.583	0.1295	1.14	Q	.	.	.	.
1.667	0.1373	1.14	QV	.	.	.	.
1.750	0.1452	1.14	QV	.	.	.	.
1.833	0.1531	1.15	QV	.	.	.	.
1.917	0.1610	1.15	QV	.	.	.	.
2.000	0.1690	1.15	QV	.	.	.	.
2.083	0.1769	1.16	QV	.	.	.	.
2.167	0.1849	1.16	QV	.	.	.	.
2.250	0.1930	1.17	QV	.	.	.	.
2.333	0.2010	1.17	QV	.	.	.	.
2.417	0.2091	1.17	QV	.	.	.	.
2.500	0.2173	1.18	QV	.	.	.	.
2.583	0.2254	1.18	QV	.	.	.	.
2.667	0.2336	1.19	QV	.	.	.	.
2.750	0.2418	1.19	QV	.	.	.	.
2.833	0.2500	1.20	QV	.	.	.	.
2.917	0.2583	1.20	QV	.	.	.	.
3.000	0.2666	1.20	QV	.	.	.	.
3.083	0.2749	1.21	Q V	.	.	.	.
3.167	0.2833	1.21	Q V	.	.	.	.
3.250	0.2917	1.22	Q V	.	.	.	.
3.333	0.3001	1.22	Q V	.	.	.	.
3.417	0.3085	1.23	Q V	.	.	.	.
3.500	0.3170	1.23	Q V	.	.	.	.
3.583	0.3255	1.24	Q V	.	.	.	.
3.667	0.3341	1.24	Q V	.	.	.	.
3.750	0.3427	1.25	Q V	.	.	.	.
3.833	0.3513	1.25	.QV	.	.	.	.
3.917	0.3599	1.26	.QV	.	.	.	.
4.000	0.3686	1.26	.QV	.	.	.	.
4.083	0.3774	1.27	.QV	.	.	.	.
4.167	0.3861	1.27	.QV	.	.	.	.
4.250	0.3949	1.28	.QV	.	.	.	.
4.333	0.4037	1.28	.QV	.	.	.	.

4.417	0.4126	1.29	.Q V	.	.	.	.
4.500	0.4215	1.29	.Q V	.	.	.	.
4.583	0.4304	1.30	.Q V	.	.	.	.
4.667	0.4394	1.30	.Q V	.	.	.	.
4.750	0.4484	1.31	.Q V	.	.	.	.
4.833	0.4575	1.31	.Q V	.	.	.	.
4.917	0.4665	1.32	.Q V	.	.	.	.
5.000	0.4757	1.33	.Q V	.	.	.	.
5.083	0.4848	1.33	.Q V	.	.	.	.
5.167	0.4941	1.34	.Q V	.	.	.	.
5.250	0.5033	1.34	.Q V	.	.	.	.
5.333	0.5126	1.35	.Q V	.	.	.	.
5.417	0.5219	1.35	.Q V	.	.	.	.
5.500	0.5313	1.36	.Q V	.	.	.	.
5.583	0.5407	1.37	.Q V	.	.	.	.
5.667	0.5502	1.37	.Q V	.	.	.	.
5.750	0.5597	1.38	.Q V	.	.	.	.
5.833	0.5692	1.39	.Q V	.	.	.	.
5.917	0.5788	1.39	.Q V	.	.	.	.
6.000	0.5884	1.40	.Q V	.	.	.	.
6.083	0.5981	1.41	.Q V	.	.	.	.
6.167	0.6079	1.41	.Q V	.	.	.	.
6.250	0.6176	1.42	.Q V	.	.	.	.
6.333	0.6275	1.43	.Q V	.	.	.	.
6.417	0.6373	1.43	.Q V	.	.	.	.
6.500	0.6472	1.44	.Q V	.	.	.	.
6.583	0.6572	1.45	.Q V	.	.	.	.
6.667	0.6672	1.46	.Q V	.	.	.	.
6.750	0.6773	1.46	.Q V	.	.	.	.
6.833	0.6874	1.47	.Q V	.	.	.	.
6.917	0.6976	1.48	.Q V	.	.	.	.
7.000	0.7078	1.49	.Q V	.	.	.	.
7.083	0.7181	1.49	.Q V	.	.	.	.
7.167	0.7285	1.50	.Q V	.	.	.	.
7.250	0.7389	1.51	.Q V	.	.	.	.
7.333	0.7493	1.52	.Q V	.	.	.	.
7.417	0.7598	1.53	.Q V	.	.	.	.
7.500	0.7704	1.53	.Q V	.	.	.	.
7.583	0.7810	1.54	.Q V	.	.	.	.
7.667	0.7917	1.55	.Q V	.	.	.	.
7.750	0.8025	1.56	.Q V	.	.	.	.
7.833	0.8133	1.57	.Q V	.	.	.	.
7.917	0.8241	1.58	.Q V	.	.	.	.
8.000	0.8351	1.59	.Q V	.	.	.	.
8.083	0.8461	1.60	.Q V	.	.	.	.
8.167	0.8572	1.61	.Q V	.	.	.	.
8.250	0.8683	1.62	.Q V	.	.	.	.
8.333	0.8795	1.63	.Q V	.	.	.	.
8.417	0.8908	1.64	.Q V	.	.	.	.
8.500	0.9021	1.65	.Q V	.	.	.	.

8.583	0.9135	1.66	.Q	V	.	.	.	.
8.667	0.9250	1.67	.Q	V	.	.	.	.
8.750	0.9366	1.68	.Q	V	.	.	.	.
8.833	0.9482	1.69	.Q	V	.	.	.	.
8.917	0.9599	1.70	.Q	V	.	.	.	.
9.000	0.9717	1.71	.Q	V	.	.	.	.
9.083	0.9836	1.72	.Q	V	.	.	.	.
9.167	0.9955	1.74	.Q	V	.	.	.	.
9.250	1.0076	1.75	.Q	V	.	.	.	.
9.333	1.0197	1.76	.Q	V	.	.	.	.
9.417	1.0319	1.77	.Q	V	.	.	.	.
9.500	1.0442	1.79	.Q	V	.	.	.	.
9.583	1.0566	1.80	.Q	V	.	.	.	.
9.667	1.0691	1.81	.Q	V	.	.	.	.
9.750	1.0816	1.83	.Q	V	.	.	.	.
9.833	1.0943	1.84	.Q	V	.	.	.	.
9.917	1.1071	1.85	.Q	V	.	.	.	.
10.000	1.1199	1.87	.Q	V	.	.	.	.
10.083	1.1329	1.88	.Q	V	.	.	.	.
10.167	1.1459	1.90	.Q	V	.	.	.	.
10.250	1.1591	1.91	.Q	V	.	.	.	.
10.333	1.1724	1.93	.Q	V	.	.	.	.
10.417	1.1858	1.94	.Q	V	.	.	.	.
10.500	1.1993	1.96	.Q	V	.	.	.	.
10.583	1.2129	1.98	.Q	V	.	.	.	.
10.667	1.2266	1.99	.Q	V.	.	.	.	.
10.750	1.2405	2.01	.Q	V.	.	.	.	.
10.833	1.2545	2.03	.Q	V.	.	.	.	.
10.917	1.2686	2.05	.Q	V.	.	.	.	.
11.000	1.2828	2.07	.Q	V.	.	.	.	.
11.083	1.2972	2.09	.Q	V.	.	.	.	.
11.167	1.3117	2.11	.Q	V.	.	.	.	.
11.250	1.3263	2.13	.Q	V.	.	.	.	.
11.333	1.3411	2.15	.Q	V.	.	.	.	.
11.417	1.3561	2.17	.Q	V.	.	.	.	.
11.500	1.3712	2.19	.Q	V	.	.	.	.
11.583	1.3864	2.21	.Q	V	.	.	.	.
11.667	1.4018	2.24	.Q	V	.	.	.	.
11.750	1.4174	2.26	.Q	V	.	.	.	.
11.833	1.4332	2.29	.Q	V	.	.	.	.
11.917	1.4491	2.31	.Q	V	.	.	.	.
12.000	1.4652	2.34	.Q	V	.	.	.	.
12.083	1.4816	2.39	.Q	V	.	.	.	.
12.167	1.4990	2.53	. Q	.V	.	.	.	.
12.250	1.5177	2.71	. Q	.V	.	.	.	.
12.333	1.5371	2.82	. Q	.V	.	.	.	.
12.417	1.5569	2.88	. Q	.V	.	.	.	.
12.500	1.5770	2.91	. Q	.V	.	.	.	.
12.583	1.5973	2.95	. Q	.V	.	.	.	.
12.667	1.6179	2.99	. Q	.V	.	.	.	.

12.750	1.6387	3.02	. Q	. V	.	.	.
12.833	1.6598	3.06	. Q	. V	.	.	.
12.917	1.6811	3.10	. Q	. V	.	.	.
13.000	1.7028	3.14	. Q	. V	.	.	.
13.083	1.7247	3.18	. Q	. V	.	.	.
13.167	1.7469	3.23	. Q	. V	.	.	.
13.250	1.7695	3.27	. Q	. V	.	.	.
13.333	1.7924	3.32	. Q	. V	.	.	.
13.417	1.8156	3.37	. Q	. V	.	.	.
13.500	1.8392	3.42	. Q	. V	.	.	.
13.583	1.8631	3.48	. Q	. V	.	.	.
13.667	1.8875	3.54	. Q	. V	.	.	.
13.750	1.9122	3.60	. Q	. V	.	.	.
13.833	1.9375	3.66	. Q	. V	.	.	.
13.917	1.9631	3.73	. Q	. V	.	.	.
14.000	1.9893	3.80	. Q	. V	.	.	.
14.083	2.0160	3.88	. Q	. V	.	.	.
14.167	2.0435	3.99	. Q	. V	.	.	.
14.250	2.0718	4.12	. Q	. V	.	.	.
14.333	2.1009	4.23	. Q	. V	.	.	.
14.417	2.1307	4.33	. Q	. V	.	.	.
14.500	2.1613	4.43	. Q	. V	.	.	.
14.583	2.1926	4.55	. Q	. V	.	.	.
14.667	2.2247	4.66	. Q	. V	.	.	.
14.750	2.2577	4.79	. Q	. V	.	.	.
14.833	2.2917	4.94	. Q	. V	.	.	.
14.917	2.3268	5.09	. Q	. V	.	.	.
15.000	2.3630	5.26	. Q	. V	.	.	.
15.083	2.4005	5.45	. Q	. V	.	.	.
15.167	2.4395	5.66	. Q	. V	.	.	.
15.250	2.4801	5.90	. Q	. V	.	.	.
15.333	2.5226	6.17	. Q	. V	.	.	.
15.417	2.5674	6.51	. Q	. V	.	.	.
15.500	2.6162	7.09	. Q	. V	.	.	.
15.583	2.6700	7.82	. Q	. V	.	.	.
15.667	2.7285	8.49	. Q	. V	.	.	.
15.750	2.7916	9.16	. Q	. V	.	.	.
15.833	2.8599	9.91	. Q	. V	.	.	.
15.917	2.9376	11.28	. Q	. V	.	.	.
16.000	3.0385	14.66	. Q	. V	.	.	.
16.083	3.1954	22.78	.	. Q	. V	.	.
16.167	3.4596	38.37	.	.	. V	. Q	.
16.250	3.7511	42.32	.	.	.	. V	. Q
16.333	3.9343	26.59	.	.	. Q	. V	.
16.417	4.0373	14.96	.	. Q	.	. V	.
16.500	4.1056	9.91	. Q	.	.	. V	.
16.583	4.1599	7.89	. Q	.	.	. V	.
16.667	4.2062	6.72	. Q	.	.	. V	.
16.750	4.2471	5.95	. Q	.	.	. V	.
16.833	4.2845	5.42	. Q	.	.	. V	.

16.917	4.3193	5.06	. Q	.	.	.V	.
17.000	4.3521	4.76	. Q	.	.	.V	.
17.083	4.3831	4.51	. Q	.	.	. V	.
17.167	4.4125	4.27	. Q	.	.	. V	.
17.250	4.4403	4.04	. Q	.	.	. V	.
17.333	4.4669	3.86	. Q	.	.	. V	.
17.417	4.4924	3.71	. Q	.	.	. V	.
17.500	4.5171	3.58	. Q	.	.	. V	.
17.583	4.5409	3.46	. Q	.	.	. V	.
17.667	4.5640	3.35	. Q	.	.	. V	.
17.750	4.5864	3.26	. Q	.	.	. V	.
17.833	4.6083	3.17	. Q	.	.	. V	.
17.917	4.6295	3.09	. Q	.	.	. V	.
18.000	4.6502	3.01	. Q	.	.	. V	.
18.083	4.6703	2.92	. Q	.	.	. V	.
18.167	4.6892	2.74	. Q	.	.	. V	.
18.250	4.7066	2.52	. Q	.	.	. V	.
18.333	4.7230	2.39	.Q	.	.	. V	.
18.417	4.7390	2.31	.Q	.	.	. V	.
18.500	4.7545	2.26	.Q	.	.	. V	.
18.583	4.7697	2.21	.Q	.	.	. V	.
18.667	4.7846	2.16	.Q	.	.	. V	.
18.750	4.7992	2.12	.Q	.	.	. V	.
18.833	4.8135	2.08	.Q	.	.	. V	.
18.917	4.8276	2.04	.Q	.	.	. V	.
19.000	4.8414	2.00	.Q	.	.	. V	.
19.083	4.8549	1.97	.Q	.	.	. V	.
19.167	4.8683	1.94	.Q	.	.	. V	.
19.250	4.8814	1.91	.Q	.	.	. V	.
19.333	4.8943	1.88	.Q	.	.	. V	.
19.417	4.9071	1.85	.Q	.	.	. V	.
19.500	4.9196	1.82	.Q	.	.	. V	.
19.583	4.9319	1.79	.Q	.	.	. V	.
19.667	4.9441	1.77	.Q	.	.	. V	.
19.750	4.9561	1.74	.Q	.	.	. V	.
19.833	4.9679	1.72	.Q	.	.	. V	.
19.917	4.9796	1.70	.Q	.	.	. V	.
20.000	4.9912	1.67	.Q	.	.	. V	.
20.083	5.0025	1.65	.Q	.	.	. V	.
20.167	5.0138	1.63	.Q	.	.	. V	.
20.250	5.0249	1.61	.Q	.	.	. V	.
20.333	5.0359	1.59	.Q	.	.	. V	.
20.417	5.0467	1.57	.Q	.	.	. V	.
20.500	5.0574	1.56	.Q	.	.	. V	.
20.583	5.0680	1.54	.Q	.	.	. V	.
20.667	5.0785	1.52	.Q	.	.	. V	.
20.750	5.0889	1.51	.Q	.	.	. V	.
20.833	5.0992	1.49	.Q	.	.	. V	.
20.917	5.1093	1.47	.Q	.	.	. V	.
21.000	5.1194	1.46	.Q	.	.	. V	.

21.083	5.1293	1.44	.Q	.	.	.	V .
21.167	5.1392	1.43	.Q	.	.	.	V .
21.250	5.1489	1.42	.Q	.	.	.	V .
21.333	5.1586	1.40	.Q	.	.	.	V .
21.417	5.1682	1.39	.Q	.	.	.	V .
21.500	5.1776	1.38	.Q	.	.	.	V .
21.583	5.1870	1.36	.Q	.	.	.	V .
21.667	5.1964	1.35	.Q	.	.	.	V .
21.750	5.2056	1.34	.Q	.	.	.	V .
21.833	5.2147	1.33	.Q	.	.	.	V .
21.917	5.2238	1.32	.Q	.	.	.	V .
22.000	5.2328	1.31	.Q	.	.	.	V .
22.083	5.2417	1.30	.Q	.	.	.	V .
22.167	5.2506	1.28	.Q	.	.	.	V .
22.250	5.2593	1.27	.Q	.	.	.	V .
22.333	5.2681	1.26	.Q	.	.	.	V .
22.417	5.2767	1.25	.Q	.	.	.	V .
22.500	5.2853	1.24	Q	.	.	.	V .
22.583	5.2938	1.23	Q	.	.	.	V .
22.667	5.3022	1.23	Q	.	.	.	V .
22.750	5.3106	1.22	Q	.	.	.	V .
22.833	5.3189	1.21	Q	.	.	.	V .
22.917	5.3271	1.20	Q	.	.	.	V .
23.000	5.3353	1.19	Q	.	.	.	V .
23.083	5.3435	1.18	Q	.	.	.	V .
23.167	5.3516	1.17	Q	.	.	.	V .
23.250	5.3596	1.16	Q	.	.	.	V .
23.333	5.3675	1.16	Q	.	.	.	V .
23.417	5.3755	1.15	Q	.	.	.	V .
23.500	5.3833	1.14	Q	.	.	.	V .
23.583	5.3911	1.13	Q	.	.	.	V .
23.667	5.3989	1.13	Q	.	.	.	V .
23.750	5.4066	1.12	Q	.	.	.	V .
23.833	5.4143	1.11	Q	.	.	.	V .
23.917	5.4219	1.10	Q	.	.	.	V .
24.000	5.4294	1.10	Q	.	.	.	V .
24.083	5.4366	1.04	Q	.	.	.	V .
24.167	5.4416	0.73	Q	.	.	.	V .
24.250	5.4437	0.30	Q	.	.	.	V .
24.333	5.4443	0.09	Q	.	.	.	V .
24.417	5.4445	0.02	Q	.	.	.	V .
24.500	5.4445	0.01	Q	.	.	.	V .
24.583	5.4446	0.00	Q	.	.	.	V .

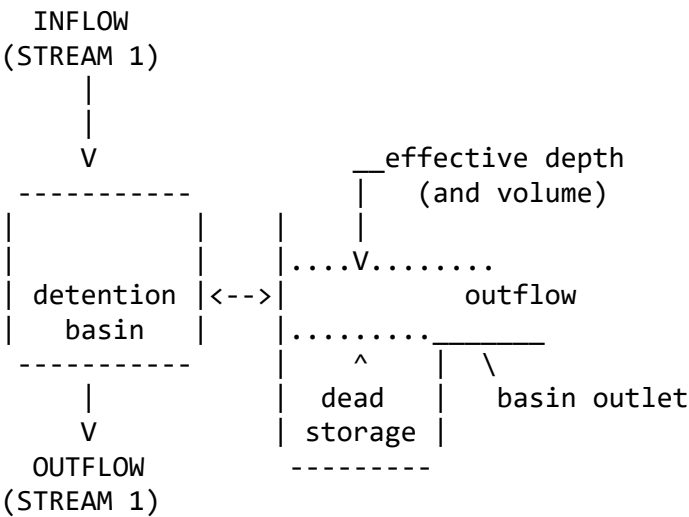
TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
 (Note: 100% of Peak Flow Rate estimate assumed to have
 an instantaneous time duration)

Percentile of Estimated
Peak Flow Rate

Duration
(minutes)

=====	=====
0%	1475.0
10%	170.0
20%	55.0
30%	30.0
40%	20.0
50%	20.0
60%	15.0
70%	10.0
80%	10.0
90%	10.0

```
*****
FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE = 3.1
-----
>>>>>FLOW-THROUGH DETENTION BASIN ROUTING MODEL APPLIED TO STREAM #1<<<<<
=====
```



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ROUTE RUNOFF HYDROGRAPH FROM STREAM NUMBER 1
THROUGH A FLOW-THROUGH DETENTION BASIN
SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
  DEAD STORAGE(AF) =          0.000
  SPECIFIED DEAD STORAGE(AF) FILLED =          0.000
  SPECIFIED EFFECTIVE VOLUME(AF) FILLED ABOVE OUTLET =          0.000
  DETENTION BASIN CONSTANT LOSS RATE(CFS) =          0.00
```

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BASIN DEPTH VERSUS OUTFLOW AND STORAGE INFORMATION:
```

INTERVAL NUMBER	DEPTH (FT)	OUTFLOW (CFS)	STORAGE (AF)
--------------------	---------------	------------------	-----------------

1	0.00	0.00	0.000
2	0.20	1.60	0.050
3	0.50	6.40	0.126
4	0.70	10.50	0.179

=====

MODIFIED-PULS BASIN ROUTING MODEL RESULTS(5-MINUTE COMPUTATION INTERVALS):
 (Note: Computed EFFECTIVE DEPTH and VOLUME are estimated at the clock time;
 MEAN OUTFLOW is the average value during the unit interval.)

CLOCK TIME (HRS)	DEAD-STORAGE FILLED(AF)	INFLOW (CFS)	LOSS (CFS)	EFFECTIVE DEPTH(FT)	MEAN OUTFLOW (CFS)	EFFECTIVE VOLUME(AF)
0.083	0.000	0.05	0.00	0.00	0.0	0.000
0.167	0.000	0.35	0.00	0.01	0.0	0.002
0.250	0.000	0.78	0.00	0.03	0.1	0.007
0.333	0.000	1.00	0.00	0.05	0.3	0.012
0.417	0.000	1.06	0.00	0.06	0.4	0.016
0.500	0.000	1.08	0.00	0.08	0.6	0.019
0.583	0.000	1.09	0.00	0.09	0.7	0.022
0.667	0.000	1.10	0.00	0.10	0.8	0.025
0.750	0.000	1.10	0.00	0.11	0.8	0.027
0.833	0.000	1.10	0.00	0.11	0.9	0.028
0.917	0.000	1.11	0.00	0.12	0.9	0.029
1.000	0.000	1.11	0.00	0.12	1.0	0.030
1.083	0.000	1.11	0.00	0.13	1.0	0.031
1.167	0.000	1.12	0.00	0.13	1.0	0.032
1.250	0.000	1.12	0.00	0.13	1.0	0.033
1.333	0.000	1.12	0.00	0.13	1.1	0.033
1.417	0.000	1.13	0.00	0.13	1.1	0.034
1.500	0.000	1.13	0.00	0.14	1.1	0.034
1.583	0.000	1.14	0.00	0.14	1.1	0.034
1.667	0.000	1.14	0.00	0.14	1.1	0.034
1.750	0.000	1.14	0.00	0.14	1.1	0.035
1.833	0.000	1.15	0.00	0.14	1.1	0.035
1.917	0.000	1.15	0.00	0.14	1.1	0.035
2.000	0.000	1.15	0.00	0.14	1.1	0.035
2.083	0.000	1.16	0.00	0.14	1.1	0.036
2.167	0.000	1.16	0.00	0.14	1.1	0.036
2.250	0.000	1.17	0.00	0.14	1.1	0.036
2.333	0.000	1.17	0.00	0.14	1.1	0.036
2.417	0.000	1.17	0.00	0.14	1.2	0.036
2.500	0.000	1.18	0.00	0.15	1.2	0.036
2.583	0.000	1.18	0.00	0.15	1.2	0.036
2.667	0.000	1.19	0.00	0.15	1.2	0.037
2.750	0.000	1.19	0.00	0.15	1.2	0.037
2.833	0.000	1.20	0.00	0.15	1.2	0.037
2.917	0.000	1.20	0.00	0.15	1.2	0.037

3.000	0.000	1.20	0.00	0.15	1.2	0.037
3.083	0.000	1.21	0.00	0.15	1.2	0.037
3.167	0.000	1.21	0.00	0.15	1.2	0.037
3.250	0.000	1.22	0.00	0.15	1.2	0.038
3.333	0.000	1.22	0.00	0.15	1.2	0.038
3.417	0.000	1.23	0.00	0.15	1.2	0.038
3.500	0.000	1.23	0.00	0.15	1.2	0.038
3.583	0.000	1.24	0.00	0.15	1.2	0.038
3.667	0.000	1.24	0.00	0.15	1.2	0.038
3.750	0.000	1.25	0.00	0.15	1.2	0.038
3.833	0.000	1.25	0.00	0.15	1.2	0.039
3.917	0.000	1.26	0.00	0.15	1.2	0.039
4.000	0.000	1.26	0.00	0.16	1.2	0.039
4.083	0.000	1.27	0.00	0.16	1.2	0.039
4.167	0.000	1.27	0.00	0.16	1.2	0.039
4.250	0.000	1.28	0.00	0.16	1.3	0.039
4.333	0.000	1.28	0.00	0.16	1.3	0.039
4.417	0.000	1.29	0.00	0.16	1.3	0.040
4.500	0.000	1.29	0.00	0.16	1.3	0.040
4.583	0.000	1.30	0.00	0.16	1.3	0.040
4.667	0.000	1.30	0.00	0.16	1.3	0.040
4.750	0.000	1.31	0.00	0.16	1.3	0.040
4.833	0.000	1.31	0.00	0.16	1.3	0.040
4.917	0.000	1.32	0.00	0.16	1.3	0.041
5.000	0.000	1.33	0.00	0.16	1.3	0.041
5.083	0.000	1.33	0.00	0.16	1.3	0.041
5.167	0.000	1.34	0.00	0.16	1.3	0.041
5.250	0.000	1.34	0.00	0.17	1.3	0.041
5.333	0.000	1.35	0.00	0.17	1.3	0.041
5.417	0.000	1.35	0.00	0.17	1.3	0.042
5.500	0.000	1.36	0.00	0.17	1.3	0.042
5.583	0.000	1.37	0.00	0.17	1.3	0.042
5.667	0.000	1.37	0.00	0.17	1.3	0.042
5.750	0.000	1.38	0.00	0.17	1.4	0.042
5.833	0.000	1.39	0.00	0.17	1.4	0.043
5.917	0.000	1.39	0.00	0.17	1.4	0.043
6.000	0.000	1.40	0.00	0.17	1.4	0.043
6.083	0.000	1.41	0.00	0.17	1.4	0.043
6.167	0.000	1.41	0.00	0.17	1.4	0.043
6.250	0.000	1.42	0.00	0.17	1.4	0.044
6.333	0.000	1.43	0.00	0.17	1.4	0.044
6.417	0.000	1.43	0.00	0.18	1.4	0.044
6.500	0.000	1.44	0.00	0.18	1.4	0.044
6.583	0.000	1.45	0.00	0.18	1.4	0.044
6.667	0.000	1.46	0.00	0.18	1.4	0.045
6.750	0.000	1.46	0.00	0.18	1.4	0.045
6.833	0.000	1.47	0.00	0.18	1.4	0.045
6.917	0.000	1.48	0.00	0.18	1.4	0.045
7.000	0.000	1.49	0.00	0.18	1.5	0.045
7.083	0.000	1.49	0.00	0.18	1.5	0.046

7.167	0.000	1.50	0.00	0.18	1.5	0.046
7.250	0.000	1.51	0.00	0.18	1.5	0.046
7.333	0.000	1.52	0.00	0.19	1.5	0.046
7.417	0.000	1.53	0.00	0.19	1.5	0.047
7.500	0.000	1.53	0.00	0.19	1.5	0.047
7.583	0.000	1.54	0.00	0.19	1.5	0.047
7.667	0.000	1.55	0.00	0.19	1.5	0.047
7.750	0.000	1.56	0.00	0.19	1.5	0.048
7.833	0.000	1.57	0.00	0.19	1.5	0.048
7.917	0.000	1.58	0.00	0.19	1.5	0.048
8.000	0.000	1.59	0.00	0.19	1.5	0.049
8.083	0.000	1.60	0.00	0.20	1.6	0.049
8.167	0.000	1.61	0.00	0.20	1.6	0.049
8.250	0.000	1.62	0.00	0.20	1.6	0.049
8.333	0.000	1.63	0.00	0.20	1.6	0.050
8.417	0.000	1.64	0.00	0.20	1.6	0.050
8.500	0.000	1.65	0.00	0.20	1.6	0.050
8.583	0.000	1.66	0.00	0.20	1.6	0.050
8.667	0.000	1.67	0.00	0.20	1.6	0.051
8.750	0.000	1.68	0.00	0.20	1.6	0.051
8.833	0.000	1.69	0.00	0.20	1.7	0.051
8.917	0.000	1.70	0.00	0.20	1.7	0.051
9.000	0.000	1.71	0.00	0.21	1.7	0.051
9.083	0.000	1.72	0.00	0.21	1.7	0.052
9.167	0.000	1.74	0.00	0.21	1.7	0.052
9.250	0.000	1.75	0.00	0.21	1.7	0.052
9.333	0.000	1.76	0.00	0.21	1.7	0.052
9.417	0.000	1.77	0.00	0.21	1.7	0.052
9.500	0.000	1.79	0.00	0.21	1.8	0.053
9.583	0.000	1.80	0.00	0.21	1.8	0.053
9.667	0.000	1.81	0.00	0.21	1.8	0.053
9.750	0.000	1.83	0.00	0.21	1.8	0.053
9.833	0.000	1.84	0.00	0.21	1.8	0.053
9.917	0.000	1.85	0.00	0.21	1.8	0.054
10.000	0.000	1.87	0.00	0.22	1.8	0.054
10.083	0.000	1.88	0.00	0.22	1.8	0.054
10.167	0.000	1.90	0.00	0.22	1.9	0.054
10.250	0.000	1.91	0.00	0.22	1.9	0.055
10.333	0.000	1.93	0.00	0.22	1.9	0.055
10.417	0.000	1.94	0.00	0.22	1.9	0.055
10.500	0.000	1.96	0.00	0.22	1.9	0.055
10.583	0.000	1.98	0.00	0.22	1.9	0.056
10.667	0.000	1.99	0.00	0.22	2.0	0.056
10.750	0.000	2.01	0.00	0.22	2.0	0.056
10.833	0.000	2.03	0.00	0.22	2.0	0.056
10.917	0.000	2.05	0.00	0.23	2.0	0.057
11.000	0.000	2.07	0.00	0.23	2.0	0.057
11.083	0.000	2.09	0.00	0.23	2.0	0.057
11.167	0.000	2.11	0.00	0.23	2.1	0.057
11.250	0.000	2.13	0.00	0.23	2.1	0.058

11.333	0.000	2.15	0.00	0.23	2.1	0.058
11.417	0.000	2.17	0.00	0.23	2.1	0.058
11.500	0.000	2.19	0.00	0.23	2.1	0.059
11.583	0.000	2.21	0.00	0.24	2.2	0.059
11.667	0.000	2.24	0.00	0.24	2.2	0.059
11.750	0.000	2.26	0.00	0.24	2.2	0.060
11.833	0.000	2.29	0.00	0.24	2.2	0.060
11.917	0.000	2.31	0.00	0.24	2.3	0.061
12.000	0.000	2.34	0.00	0.24	2.3	0.061
12.083	0.000	2.39	0.00	0.25	2.3	0.062
12.167	0.000	2.53	0.00	0.25	2.4	0.063
12.250	0.000	2.71	0.00	0.26	2.5	0.064
12.333	0.000	2.82	0.00	0.26	2.6	0.066
12.417	0.000	2.88	0.00	0.27	2.7	0.068
12.500	0.000	2.91	0.00	0.27	2.7	0.069
12.583	0.000	2.95	0.00	0.28	2.8	0.070
12.667	0.000	2.99	0.00	0.28	2.9	0.070
12.750	0.000	3.02	0.00	0.28	2.9	0.071
12.833	0.000	3.06	0.00	0.29	3.0	0.072
12.917	0.000	3.10	0.00	0.29	3.0	0.073
13.000	0.000	3.14	0.00	0.29	3.0	0.073
13.083	0.000	3.18	0.00	0.29	3.1	0.074
13.167	0.000	3.23	0.00	0.30	3.1	0.075
13.250	0.000	3.27	0.00	0.30	3.2	0.075
13.333	0.000	3.32	0.00	0.30	3.2	0.076
13.417	0.000	3.37	0.00	0.31	3.3	0.077
13.500	0.000	3.42	0.00	0.31	3.3	0.077
13.583	0.000	3.48	0.00	0.31	3.4	0.078
13.667	0.000	3.54	0.00	0.32	3.4	0.079
13.750	0.000	3.60	0.00	0.32	3.5	0.080
13.833	0.000	3.66	0.00	0.32	3.5	0.081
13.917	0.000	3.73	0.00	0.33	3.6	0.082
14.000	0.000	3.80	0.00	0.33	3.6	0.083
14.083	0.000	3.88	0.00	0.33	3.7	0.084
14.167	0.000	3.99	0.00	0.34	3.8	0.085
14.250	0.000	4.12	0.00	0.35	3.9	0.087
14.333	0.000	4.23	0.00	0.35	4.0	0.089
14.417	0.000	4.33	0.00	0.36	4.1	0.090
14.500	0.000	4.43	0.00	0.37	4.2	0.092
14.583	0.000	4.55	0.00	0.37	4.3	0.094
14.667	0.000	4.66	0.00	0.38	4.4	0.095
14.750	0.000	4.79	0.00	0.39	4.5	0.097
14.833	0.000	4.94	0.00	0.39	4.6	0.099
14.917	0.000	5.09	0.00	0.40	4.8	0.101
15.000	0.000	5.26	0.00	0.41	4.9	0.104
15.083	0.000	5.45	0.00	0.42	5.1	0.106
15.167	0.000	5.66	0.00	0.43	5.2	0.109
15.250	0.000	5.90	0.00	0.45	5.4	0.112
15.333	0.000	6.17	0.00	0.46	5.6	0.116
15.417	0.000	6.51	0.00	0.48	5.9	0.120

15.500	0.000	7.09	0.00	0.50	6.2	0.126
15.583	0.000	7.82	0.00	0.53	6.7	0.134
15.667	0.000	8.49	0.00	0.56	7.3	0.142
15.750	0.000	9.16	0.00	0.59	7.9	0.150
15.833	0.000	9.91	0.00	0.62	8.6	0.159
15.917	0.000	11.28	0.00	0.67	9.5	0.172
16.000	*BASIN CAPACITY EXCEEDED: BASIN DATA IS EXTRAPOLATED*					
16.000	0.000	14.66	0.00	0.77	10.9	0.197
16.083	*BASIN CAPACITY EXCEEDED: BASIN DATA IS EXTRAPOLATED*					
16.083	0.000	22.78	0.00	0.99	14.2	0.256
16.167	*BASIN CAPACITY EXCEEDED: BASIN DATA IS EXTRAPOLATED*					
16.167	0.000	38.37	0.00	1.44	21.1	0.375
16.250	*BASIN CAPACITY EXCEEDED: BASIN DATA IS EXTRAPOLATED*					
16.250	0.000	42.32	0.00	1.78	29.2	0.466
16.333	*BASIN CAPACITY EXCEEDED: BASIN DATA IS EXTRAPOLATED*					
16.333	0.000	26.59	0.00	1.66	31.4	0.433
16.417	*BASIN CAPACITY EXCEEDED: BASIN DATA IS EXTRAPOLATED*					
16.417	0.000	14.96	0.00	1.35	26.9	0.350
16.500	*BASIN CAPACITY EXCEEDED: BASIN DATA IS EXTRAPOLATED*					
16.500	0.000	9.91	0.00	1.06	20.8	0.275
16.583	*BASIN CAPACITY EXCEEDED: BASIN DATA IS EXTRAPOLATED*					
16.583	0.000	7.89	0.00	0.86	15.8	0.220
16.667	*BASIN CAPACITY EXCEEDED: BASIN DATA IS EXTRAPOLATED*					
16.667	0.000	6.72	0.00	0.71	12.2	0.182
16.750	0.000	5.95	0.00	0.61	9.8	0.156
16.833	0.000	5.42	0.00	0.55	8.0	0.138
16.917	0.000	5.06	0.00	0.50	6.9	0.126
17.000	0.000	4.76	0.00	0.46	6.1	0.117
17.083	0.000	4.51	0.00	0.43	5.6	0.109
17.167	0.000	4.27	0.00	0.41	5.1	0.103
17.250	0.000	4.04	0.00	0.39	4.8	0.098
17.333	0.000	3.86	0.00	0.37	4.5	0.094
17.417	0.000	3.71	0.00	0.36	4.2	0.090
17.500	0.000	3.58	0.00	0.35	4.0	0.087
17.583	0.000	3.46	0.00	0.34	3.8	0.084
17.667	0.000	3.35	0.00	0.33	3.7	0.082
17.750	0.000	3.26	0.00	0.32	3.6	0.080
17.833	0.000	3.17	0.00	0.31	3.4	0.078
17.917	0.000	3.09	0.00	0.30	3.3	0.076
18.000	0.000	3.01	0.00	0.30	3.2	0.075
18.083	0.000	2.92	0.00	0.29	3.1	0.074
18.167	0.000	2.74	0.00	0.29	3.0	0.072
18.250	0.000	2.52	0.00	0.28	2.9	0.069
18.333	0.000	2.39	0.00	0.27	2.7	0.067
18.417	0.000	2.31	0.00	0.26	2.6	0.065
18.500	0.000	2.26	0.00	0.25	2.5	0.063
18.583	0.000	2.21	0.00	0.25	2.4	0.062
18.667	0.000	2.16	0.00	0.24	2.3	0.061
18.750	0.000	2.12	0.00	0.24	2.3	0.060
18.833	0.000	2.08	0.00	0.24	2.2	0.059

18.917	0.000	2.04	0.00	0.23	2.1	0.058
19.000	0.000	2.00	0.00	0.23	2.1	0.058
19.083	0.000	1.97	0.00	0.23	2.1	0.057
19.167	0.000	1.94	0.00	0.23	2.0	0.056
19.250	0.000	1.91	0.00	0.22	2.0	0.056
19.333	0.000	1.88	0.00	0.22	2.0	0.055
19.417	0.000	1.85	0.00	0.22	1.9	0.055
19.500	0.000	1.82	0.00	0.22	1.9	0.054
19.583	0.000	1.79	0.00	0.22	1.9	0.054
19.667	0.000	1.77	0.00	0.21	1.8	0.053
19.750	0.000	1.74	0.00	0.21	1.8	0.053
19.833	0.000	1.72	0.00	0.21	1.8	0.053
19.917	0.000	1.70	0.00	0.21	1.8	0.052
20.000	0.000	1.67	0.00	0.21	1.7	0.052
20.083	0.000	1.65	0.00	0.21	1.7	0.051
20.167	0.000	1.63	0.00	0.20	1.7	0.051
20.250	0.000	1.61	0.00	0.20	1.7	0.051
20.333	0.000	1.59	0.00	0.20	1.6	0.050
20.417	0.000	1.57	0.00	0.20	1.6	0.050
20.500	0.000	1.56	0.00	0.20	1.6	0.050
20.583	0.000	1.54	0.00	0.20	1.6	0.050
20.667	0.000	1.52	0.00	0.20	1.6	0.049
20.750	0.000	1.51	0.00	0.19	1.6	0.049
20.833	0.000	1.49	0.00	0.19	1.6	0.048
20.917	0.000	1.47	0.00	0.19	1.5	0.048
21.000	0.000	1.46	0.00	0.19	1.5	0.047
21.083	0.000	1.44	0.00	0.19	1.5	0.047
21.167	0.000	1.43	0.00	0.19	1.5	0.047
21.250	0.000	1.42	0.00	0.18	1.5	0.046
21.333	0.000	1.40	0.00	0.18	1.5	0.046
21.417	0.000	1.39	0.00	0.18	1.5	0.045
21.500	0.000	1.38	0.00	0.18	1.4	0.045
21.583	0.000	1.36	0.00	0.18	1.4	0.044
21.667	0.000	1.35	0.00	0.18	1.4	0.044
21.750	0.000	1.34	0.00	0.17	1.4	0.044
21.833	0.000	1.33	0.00	0.17	1.4	0.043
21.917	0.000	1.32	0.00	0.17	1.4	0.043
22.000	0.000	1.31	0.00	0.17	1.4	0.042
22.083	0.000	1.30	0.00	0.17	1.3	0.042
22.167	0.000	1.28	0.00	0.17	1.3	0.042
22.250	0.000	1.27	0.00	0.17	1.3	0.041
22.333	0.000	1.26	0.00	0.16	1.3	0.041
22.417	0.000	1.25	0.00	0.16	1.3	0.041
22.500	0.000	1.24	0.00	0.16	1.3	0.040
22.583	0.000	1.23	0.00	0.16	1.3	0.040
22.667	0.000	1.23	0.00	0.16	1.3	0.040
22.750	0.000	1.22	0.00	0.16	1.3	0.039
22.833	0.000	1.21	0.00	0.16	1.3	0.039
22.917	0.000	1.20	0.00	0.15	1.2	0.039
23.000	0.000	1.19	0.00	0.15	1.2	0.038

23.083	0.000	1.18	0.00	0.15	1.2	0.038
23.167	0.000	1.17	0.00	0.15	1.2	0.038
23.250	0.000	1.16	0.00	0.15	1.2	0.038
23.333	0.000	1.16	0.00	0.15	1.2	0.037
23.417	0.000	1.15	0.00	0.15	1.2	0.037
23.500	0.000	1.14	0.00	0.15	1.2	0.037
23.583	0.000	1.13	0.00	0.15	1.2	0.036
23.667	0.000	1.13	0.00	0.14	1.2	0.036
23.750	0.000	1.12	0.00	0.14	1.2	0.036
23.833	0.000	1.11	0.00	0.14	1.1	0.036
23.917	0.000	1.10	0.00	0.14	1.1	0.035
24.000	0.000	1.10	0.00	0.14	1.1	0.035
24.083	0.000	1.04	0.00	0.14	1.1	0.035
24.167	0.000	0.73	0.00	0.13	1.1	0.032
24.250	0.000	0.30	0.00	0.11	1.0	0.028
24.333	0.000	0.09	0.00	0.09	0.8	0.023
24.417	0.000	0.02	0.00	0.07	0.7	0.018
24.500	0.000	0.01	0.00	0.06	0.5	0.015
24.583	0.000	0.00	0.00	0.05	0.4	0.012
24.667	0.000	0.00	0.00	0.04	0.3	0.010
24.750	0.000	0.00	0.00	0.03	0.3	0.008
24.833	0.000	0.00	0.00	0.02	0.2	0.006
24.917	0.000	0.00	0.00	0.02	0.2	0.005
25.000	0.000	0.00	0.00	0.02	0.1	0.004
25.083	0.000	0.00	0.00	0.01	0.1	0.003
25.167	0.000	0.00	0.00	0.01	0.1	0.003
25.250	0.000	0.00	0.00	0.01	0.1	0.002
25.333	0.000	0.00	0.00	0.01	0.1	0.002
25.417	0.000	0.00	0.00	0.01	0.0	0.001
25.500	0.000	0.00	0.00	0.00	0.0	0.001
25.583	0.000	0.00	0.00	0.00	0.0	0.001
25.667	0.000	0.00	0.00	0.00	0.0	0.001
25.750	0.000	0.00	0.00	0.00	0.0	0.001
25.833	0.000	0.00	0.00	0.00	0.0	0.000
25.917	0.000	0.00	0.00	0.00	0.0	0.000
26.000	0.000	0.00	0.00	0.00	0.0	0.000
26.083	0.000	0.00	0.00	0.00	0.0	0.000
26.167	0.000	0.00	0.00	0.00	0.0	0.000
26.250	0.000	0.00	0.00	0.00	0.0	0.000
26.333	0.000	0.00	0.00	0.00	0.0	0.000
26.417	0.000	0.00	0.00	0.00	0.0	0.000
26.500	0.000	0.00	0.00	0.00	0.0	0.000
26.583	0.000	0.00	0.00	0.00	0.0	0.000
26.667	0.000	0.00	0.00	0.00	0.0	0.000
26.750	0.000	0.00	0.00	0.00	0.0	0.000
26.833	0.000	0.00	0.00	0.00	0.0	0.000
26.917	0.000	0.00	0.00	0.00	0.0	0.000
27.000	0.000	0.00	0.00	0.00	0.0	0.000
27.083	0.000	0.00	0.00	0.00	0.0	0.000
27.167	0.000	0.00	0.00	0.00	0.0	0.000

27.250	0.000	0.00	0.00	0.00	0.0	0.000
27.333	0.000	0.00	0.00	0.00	0.0	0.000
27.417	0.000	0.00	0.00	0.00	0.0	0.000
27.500	0.000	0.00	0.00	0.00	0.0	0.000
27.583	0.000	0.00	0.00	0.00	0.0	0.000
27.667	0.000	0.00	0.00	0.00	0.0	0.000
27.750	0.000	0.00	0.00	0.00	0.0	0.000
27.833	0.000	0.00	0.00	0.00	0.0	0.000
27.917	0.000	0.00	0.00	0.00	0.0	0.000
28.000	0.000	0.00	0.00	0.00	0.0	0.000
28.083	0.000	0.00	0.00	0.00	0.0	0.000
28.167	0.000	0.00	0.00	0.00	0.0	0.000
28.250	0.000	0.00	0.00	0.00	0.0	0.000
28.333	0.000	0.00	0.00	0.00	0.0	0.000
28.417	0.000	0.00	0.00	0.00	0.0	0.000
28.500	0.000	0.00	0.00	0.00	0.0	0.000
28.583	0.000	0.00	0.00	0.00	0.0	0.000
28.667	0.000	0.00	0.00	0.00	0.0	0.000
28.750	0.000	0.00	0.00	0.00	0.0	0.000
28.833	0.000	0.00	0.00	0.00	0.0	0.000
28.917	0.000	0.00	0.00	0.00	0.0	0.000
29.000	0.000	0.00	0.00	0.00	0.0	0.000
29.083	0.000	0.00	0.00	0.00	0.0	0.000
29.167	0.000	0.00	0.00	0.00	0.0	0.000
29.250	0.000	0.00	0.00	0.00	0.0	0.000
29.333	0.000	0.00	0.00	0.00	0.0	0.000
29.417	0.000	0.00	0.00	0.00	0.0	0.000
29.500	0.000	0.00	0.00	0.00	0.0	0.000
29.583	0.000	0.00	0.00	0.00	0.0	0.000
29.667	0.000	0.00	0.00	0.00	0.0	0.000
29.750	0.000	0.00	0.00	0.00	0.0	0.000
29.833	0.000	0.00	0.00	0.00	0.0	0.000
29.917	0.000	0.00	0.00	0.00	0.0	0.000
30.000	0.000	0.00	0.00	0.00	0.0	0.000
30.083	0.000	0.00	0.00	0.00	0.0	0.000
30.167	0.000	0.00	0.00	0.00	0.0	0.000
30.250	0.000	0.00	0.00	0.00	0.0	0.000
30.333	0.000	0.00	0.00	0.00	0.0	0.000
30.417	0.000	0.00	0.00	0.00	0.0	0.000
30.500	0.000	0.00	0.00	0.00	0.0	0.000
30.583	0.000	0.00	0.00	0.00	0.0	0.000
30.667	0.000	0.00	0.00	0.00	0.0	0.000
30.750	0.000	0.00	0.00	0.00	0.0	0.000
30.833	0.000	0.00	0.00	0.00	0.0	0.000
30.917	0.000	0.00	0.00	0.00	0.0	0.000
31.000	0.000	0.00	0.00	0.00	0.0	0.000
31.083	0.000	0.00	0.00	0.00	0.0	0.000
31.167	0.000	0.00	0.00	0.00	0.0	0.000
31.250	0.000	0.00	0.00	0.00	0.0	0.000
31.333	0.000	0.00	0.00	0.00	0.0	0.000

31.417	0.000	0.00	0.00	0.00	0.0	0.000
31.500	0.000	0.00	0.00	0.00	0.0	0.000
31.583	0.000	0.00	0.00	0.00	0.0	0.000
31.667	0.000	0.00	0.00	0.00	0.0	0.000
31.750	0.000	0.00	0.00	0.00	0.0	0.000
31.833	0.000	0.00	0.00	0.00	0.0	0.000
31.917	0.000	0.00	0.00	0.00	0.0	0.000
32.000	0.000	0.00	0.00	0.00	0.0	0.000
32.083	0.000	0.00	0.00	0.00	0.0	0.000
32.167	0.000	0.00	0.00	0.00	0.0	0.000
32.250	0.000	0.00	0.00	0.00	0.0	0.000
32.333	0.000	0.00	0.00	0.00	0.0	0.000
32.417	0.000	0.00	0.00	0.00	0.0	0.000
32.500	0.000	0.00	0.00	0.00	0.0	0.000
32.583	0.000	0.00	0.00	0.00	0.0	0.000
32.667	0.000	0.00	0.00	0.00	0.0	0.000
32.750	0.000	0.00	0.00	0.00	0.0	0.000
32.833	0.000	0.00	0.00	0.00	0.0	0.000
32.917	0.000	0.00	0.00	0.00	0.0	0.000
33.000	0.000	0.00	0.00	0.00	0.0	0.000
33.083	0.000	0.00	0.00	0.00	0.0	0.000
33.167	0.000	0.00	0.00	0.00	0.0	0.000
33.250	0.000	0.00	0.00	0.00	0.0	0.000
33.333	0.000	0.00	0.00	0.00	0.0	0.000
33.417	0.000	0.00	0.00	0.00	0.0	0.000
33.500	0.000	0.00	0.00	0.00	0.0	0.000
33.583	0.000	0.00	0.00	0.00	0.0	0.000
33.667	0.000	0.00	0.00	0.00	0.0	0.000
33.750	0.000	0.00	0.00	0.00	0.0	0.000
33.833	0.000	0.00	0.00	0.00	0.0	0.000
33.917	0.000	0.00	0.00	0.00	0.0	0.000
34.000	0.000	0.00	0.00	0.00	0.0	0.000
34.083	0.000	0.00	0.00	0.00	0.0	0.000
34.167	0.000	0.00	0.00	0.00	0.0	0.000
34.250	0.000	0.00	0.00	0.00	0.0	0.000
34.333	0.000	0.00	0.00	0.00	0.0	0.000
34.417	0.000	0.00	0.00	0.00	0.0	0.000
34.500	0.000	0.00	0.00	0.00	0.0	0.000
34.583	0.000	0.00	0.00	0.00	0.0	0.000
34.667	0.000	0.00	0.00	0.00	0.0	0.000
34.750	0.000	0.00	0.00	0.00	0.0	0.000
34.833	0.000	0.00	0.00	0.00	0.0	0.000
34.917	0.000	0.00	0.00	0.00	0.0	0.000
35.000	0.000	0.00	0.00	0.00	0.0	0.000
35.083	0.000	0.00	0.00	0.00	0.0	0.000
35.167	0.000	0.00	0.00	0.00	0.0	0.000
35.250	0.000	0.00	0.00	0.00	0.0	0.000
35.333	0.000	0.00	0.00	0.00	0.0	0.000
35.417	0.000	0.00	0.00	0.00	0.0	0.000
35.500	0.000	0.00	0.00	0.00	0.0	0.000

35.583	0.000	0.00	0.00	0.00	0.0	0.000
35.667	0.000	0.00	0.00	0.00	0.0	0.000
35.750	0.000	0.00	0.00	0.00	0.0	0.000
35.833	0.000	0.00	0.00	0.00	0.0	0.000
35.917	0.000	0.00	0.00	0.00	0.0	0.000

PROCESS SUMMARY OF STORAGE:

INFLOW VOLUME = 5.445 AF
 BASIN STORAGE = 0.000 AF (WITH 0.000 AF INITIALLY FILLED)
 OUTFLOW VOLUME = 5.445 AF
 LOSS VOLUME = 0.000 AF

FLOW PROCESS FROM NODE 3.00 TO NODE 4.00 IS CODE = 4

>>>>MODEL PIPEFLOW ROUTING OF STREAM #1<<<<

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MODEL PIPEFLOW ROUTING OF STREAM 1 WHERE
 STORAGE EFFECTS ARE NEGLECTED WITHIN THE PIPE, FLOW
 VELOCITIES ARE ESTIMATED BY ASSUMING STEADY FLOW FOR
 EACH UNIT INTERVAL(NORMAL DEPTH, Dn), AND FLOWS IN EXCESS
 OF (.82)(DIAMETER) ARE PONDED AT THE UPSTREAM INLET:
 UNIT INTERVAL FLOW VELOCITY COMPUTED USING Dn UP TO
 (0.938)(DIAMETER):

PIPELENGTH(FT) = 1830.00 MANNINGS FACTOR = 0.013
 UPSTREAM ELEVATION(FT) = 1225.00
 DOWNSTREAM ELEVATION(FT) = 1195.00
 PIPE DIAMETER(FT) = 2.00

NORMAL DEPTH VELOCITY PIPE ROUTING RESULTS:

TIME (HRS)	INFLOW (CFS)	VELOCITY (FPS)	OUTFLOW (CFS)	UPSTREAM PONDING(AF)
0.083	0.01	0.50	0.00	0.000
0.167	0.04	0.50	0.00	0.000
0.250	0.15	0.50	0.00	0.000
0.333	0.30	0.98	0.00	0.000
0.417	0.44	1.46	0.00	0.000
0.500	0.57	1.87	0.00	0.000
0.583	0.67	2.21	0.00	0.000
0.667	0.75	2.49	0.00	0.000
0.750	0.82	2.72	0.95	0.000
0.833	0.88	2.90	1.37	0.000

0.917	0.92	3.05	1.03	0.000
1.000	0.96	3.17	0.99	0.000
1.083	0.99	3.27	1.09	0.000
1.167	1.01	3.36	1.06	0.000
1.250	1.04	3.43	1.17	0.000
1.333	1.05	3.48	1.09	0.000
1.417	1.07	3.53	1.07	0.000
1.500	1.08	3.57	1.08	0.000
1.583	1.09	3.61	1.09	0.000
1.667	1.10	3.64	1.10	0.000
1.750	1.11	3.67	1.11	0.000
1.833	1.12	3.69	1.12	0.000
1.917	1.12	3.71	1.12	0.000
2.000	1.13	3.73	1.13	0.000
2.083	1.13	3.75	1.13	0.000
2.167	1.14	3.77	1.14	0.000
2.250	1.14	3.79	1.14	0.000
2.333	1.15	3.80	1.15	0.000
2.417	1.15	3.82	1.15	0.000
2.500	1.16	3.83	1.16	0.000
2.583	1.16	3.85	1.16	0.000
2.667	1.17	3.86	1.17	0.000
2.750	1.17	3.88	1.17	0.000
2.833	1.18	3.89	1.18	0.000
2.917	1.18	3.91	1.18	0.000
3.000	1.18	3.92	1.18	0.000
3.083	1.19	3.94	1.19	0.000
3.167	1.19	3.95	1.19	0.000
3.250	1.20	3.97	1.20	0.000
3.333	1.20	3.98	1.20	0.000
3.417	1.21	4.00	1.21	0.000
3.500	1.21	4.01	1.21	0.000
3.583	1.22	4.03	1.22	0.000
3.667	1.22	4.04	1.22	0.000
3.750	1.23	4.06	1.23	0.000
3.833	1.23	4.07	1.23	0.000
3.917	1.23	4.09	1.23	0.000
4.000	1.24	4.10	1.24	0.000
4.083	1.24	4.12	1.24	0.000
4.167	1.25	4.14	1.25	0.000
4.250	1.25	4.15	1.25	0.000
4.333	1.26	4.17	1.26	0.000
4.417	1.26	4.18	1.26	0.000
4.500	1.27	4.20	1.27	0.000
4.583	1.27	4.22	1.27	0.000
4.667	1.28	4.24	1.28	0.000
4.750	1.28	4.25	1.28	0.000
4.833	1.29	4.27	1.29	0.000
4.917	1.30	4.29	1.30	0.000
5.000	1.30	4.31	1.30	0.000

5.083	1.31	4.32	1.31	0.000
5.167	1.31	4.34	1.31	0.000
5.250	1.32	4.36	1.32	0.000
5.333	1.32	4.38	1.32	0.000
5.417	1.33	4.40	1.33	0.000
5.500	1.33	4.42	1.33	0.000
5.583	1.34	4.44	1.34	0.000
5.667	1.35	4.46	1.35	0.000
5.750	1.35	4.48	1.35	0.000
5.833	1.36	4.50	1.36	0.000
5.917	1.36	4.52	1.36	0.000
6.000	1.37	4.54	1.37	0.000
6.083	1.38	4.56	1.38	0.000
6.167	1.38	4.58	1.38	0.000
6.250	1.39	4.60	1.39	0.000
6.333	1.40	4.62	1.40	0.000
6.417	1.40	4.65	1.40	0.000
6.500	1.41	4.67	1.41	0.000
6.583	1.42	4.69	1.42	0.000
6.667	1.42	4.71	1.42	0.000
6.750	1.43	4.74	1.43	0.000
6.833	1.44	4.76	1.44	0.000
6.917	1.44	4.78	1.44	0.000
7.000	1.45	4.80	1.45	0.000
7.083	1.46	4.80	1.46	0.000
7.167	1.47	4.81	1.46	0.000
7.250	1.47	4.81	1.47	0.000
7.333	1.48	4.82	1.47	0.000
7.417	1.49	4.82	1.48	0.000
7.500	1.50	4.83	1.49	0.000
7.583	1.51	4.84	1.50	0.000
7.667	1.51	4.84	1.51	0.000
7.750	1.52	4.85	1.51	0.000
7.833	1.53	4.85	1.52	0.000
7.917	1.54	4.86	1.53	0.000
8.000	1.55	4.86	1.54	0.000
8.083	1.56	4.87	1.55	0.000
8.167	1.57	4.88	1.56	0.000
8.250	1.58	4.88	1.57	0.000
8.333	1.58	4.89	1.58	0.000
8.417	1.59	4.90	1.58	0.000
8.500	1.61	4.91	1.59	0.000
8.583	1.62	4.92	1.61	0.000
8.667	1.64	4.93	1.62	0.000
8.750	1.65	4.94	1.64	0.000
8.833	1.66	4.94	1.65	0.000
8.917	1.67	4.95	1.66	0.000
9.000	1.69	4.96	1.67	0.000
9.083	1.70	4.97	1.69	0.000
9.167	1.71	4.98	1.70	0.000

9.250	1.72	4.99	1.71	0.000
9.333	1.73	4.99	1.72	0.000
9.417	1.74	5.00	1.73	0.000
9.500	1.76	5.01	1.75	0.000
9.583	1.77	5.02	1.76	0.000
9.667	1.78	5.03	1.77	0.000
9.750	1.79	5.04	1.78	0.000
9.833	1.81	5.05	1.80	0.000
9.917	1.82	5.06	1.81	0.000
10.000	1.84	5.07	1.82	0.000
10.083	1.85	5.08	1.84	0.000
10.167	1.86	5.09	1.85	0.000
10.250	1.88	5.10	1.87	0.000
10.333	1.89	5.11	1.88	0.000
10.417	1.91	5.12	1.89	0.000
10.500	1.92	5.13	1.91	0.000
10.583	1.94	5.14	1.93	0.000
10.667	1.96	5.15	1.94	0.000
10.750	1.97	5.16	1.96	0.000
10.833	1.99	5.17	1.98	0.000
10.917	2.01	5.19	1.99	0.000
11.000	2.03	5.20	2.01	0.000
11.083	2.04	5.21	2.03	0.000
11.167	2.06	5.22	2.05	0.000
11.250	2.08	5.24	2.07	0.000
11.333	2.10	5.25	2.09	0.000
11.417	2.12	5.27	2.11	0.000
11.500	2.14	5.28	2.13	0.000
11.583	2.16	5.30	2.15	0.000
11.667	2.19	5.31	2.17	0.000
11.750	2.21	5.33	2.19	0.000
11.833	2.23	5.34	2.21	0.000
11.917	2.26	5.36	2.24	0.000
12.000	2.28	5.38	2.26	0.000
12.083	2.31	5.40	2.29	0.000
12.167	2.36	5.43	2.32	0.000
12.250	2.45	5.50	2.37	0.000
12.333	2.57	5.58	2.47	0.000
12.417	2.67	5.65	2.59	0.000
12.500	2.75	5.70	2.69	0.000
12.583	2.81	5.75	2.77	0.000
12.667	2.87	5.79	2.83	0.000
12.750	2.92	5.82	2.89	0.000
12.833	2.96	5.84	2.93	0.000
12.917	3.00	5.87	2.97	0.000
13.000	3.05	5.89	3.01	0.000
13.083	3.09	5.91	3.06	0.000
13.167	3.13	5.93	3.10	0.000
13.250	3.17	5.96	3.14	0.000
13.333	3.22	5.98	3.18	0.000

13.417	3.26	6.01	3.23	0.000
13.500	3.31	6.03	3.28	0.000
13.583	3.36	6.06	3.33	0.000
13.667	3.41	6.09	3.38	0.000
13.750	3.47	6.12	3.44	0.000
13.833	3.53	6.15	3.49	0.000
13.917	3.59	6.18	3.54	0.000
14.000	3.65	6.22	3.61	0.000
14.083	3.72	6.25	3.67	0.000
14.167	3.79	6.29	3.74	0.000
14.250	3.89	6.34	3.83	0.000
14.333	3.99	6.40	3.92	0.000
14.417	4.09	6.46	4.03	0.000
14.500	4.19	6.51	4.13	0.000
14.583	4.30	6.57	4.24	0.000
14.667	4.41	6.62	4.34	0.000
14.750	4.52	6.67	4.45	0.000
14.833	4.65	6.72	4.57	0.000
14.917	4.78	6.77	4.69	0.000
15.000	4.92	6.83	4.83	0.000
15.083	5.07	6.89	4.98	0.000
15.167	5.25	6.97	5.14	0.000
15.250	5.44	7.04	5.32	0.000
15.333	5.65	7.13	5.52	0.000
15.417	5.90	7.23	5.75	0.000
15.500	6.22	7.33	6.02	0.000
15.583	6.70	7.49	6.42	0.000
15.667	7.31	7.69	6.97	0.000
15.750	7.95	7.89	7.60	0.000
15.833	8.62	8.09	8.27	0.000
15.917	9.45	8.27	8.97	0.000
16.000	10.93	8.58	10.13	0.000
16.083	14.21	9.17	12.53	0.000
16.167	21.09	10.04	17.73	0.000
16.250	29.19	10.51	24.98	0.002
16.333	31.41	10.51	28.97	0.018
16.417	26.93	10.51	28.97	0.004
16.500	20.84	10.07	25.28	0.000
16.583	15.81	9.43	18.59	0.000
16.667	12.23	8.82	14.00	0.000
16.750	9.75	8.33	11.08	0.000
16.833	8.04	7.92	8.99	0.000
16.917	6.86	7.55	7.51	0.000
17.000	6.09	7.29	6.54	0.000
17.083	5.57	7.10	5.88	0.000
17.167	5.15	6.93	5.40	0.000
17.250	4.79	6.78	5.01	0.000
17.333	4.49	6.65	4.69	0.000
17.417	4.24	6.53	4.40	0.000
17.500	4.03	6.42	4.16	0.000

17.583	3.84	6.32	3.96	0.000
17.667	3.69	6.24	3.79	0.000
17.750	3.55	6.16	3.64	0.000
17.833	3.43	6.10	3.51	0.000
17.917	3.32	6.04	3.43	0.000
18.000	3.22	5.99	3.29	0.000
18.083	3.13	5.94	3.20	0.000
18.167	3.02	5.88	3.11	0.000
18.250	2.88	5.80	3.00	0.000
18.333	2.73	5.69	2.85	0.000
18.417	2.59	5.60	2.68	0.000
18.500	2.48	5.52	2.56	0.000
18.583	2.39	5.46	2.46	0.000
18.667	2.32	5.40	2.37	0.000
18.750	2.26	5.36	2.30	0.000
18.833	2.20	5.32	2.24	0.000
18.917	2.15	5.29	2.19	0.000
19.000	2.10	5.25	2.14	0.000
19.083	2.06	5.22	2.10	0.000
19.167	2.02	5.20	2.06	0.000
19.250	1.99	5.17	2.02	0.000
19.333	1.95	5.15	1.98	0.000
19.417	1.92	5.12	1.95	0.000
19.500	1.89	5.10	1.92	0.000
19.583	1.86	5.08	1.89	0.000
19.667	1.83	5.06	1.86	0.000
19.750	1.80	5.04	1.83	0.000
19.833	1.78	5.03	1.80	0.000
19.917	1.75	5.01	1.78	0.000
20.000	1.73	4.99	1.75	0.000
20.083	1.71	4.97	1.73	0.000
20.167	1.68	4.96	1.70	0.000
20.250	1.66	4.94	1.68	0.000
20.333	1.64	4.93	1.66	0.000
20.417	1.62	4.92	1.64	0.000
20.500	1.60	4.90	1.62	0.000
20.583	1.59	4.89	1.60	0.000
20.667	1.58	4.89	1.59	0.000
20.750	1.57	4.88	1.58	0.000
20.833	1.55	4.87	1.56	0.000
20.917	1.54	4.86	1.55	0.000
21.000	1.52	4.85	1.54	0.000
21.083	1.51	4.84	1.52	0.000
21.167	1.50	4.83	1.51	0.000
21.250	1.48	4.82	1.50	0.000
21.333	1.47	4.81	1.48	0.000
21.417	1.45	4.80	1.47	0.000
21.500	1.44	4.76	1.45	0.000
21.583	1.43	4.72	1.43	0.000
21.667	1.41	4.68	1.41	0.000

21.750	1.40	4.63	1.40	0.000
21.833	1.39	4.59	1.39	0.000
21.917	1.37	4.55	1.37	0.000
22.000	1.36	4.51	1.36	0.000
22.083	1.35	4.47	1.35	0.000
22.167	1.34	4.43	1.34	0.000
22.250	1.33	4.39	1.33	0.000
22.333	1.31	4.35	1.31	0.000
22.417	1.30	4.32	1.30	0.000
22.500	1.29	4.28	1.29	0.000
22.583	1.28	4.24	1.28	0.000
22.667	1.27	4.21	1.27	0.000
22.750	1.26	4.18	1.26	0.000
22.833	1.25	4.14	1.25	0.000
22.917	1.24	4.11	1.24	0.000
23.000	1.23	4.08	1.23	0.000
23.083	1.22	4.05	1.22	0.000
23.167	1.21	4.02	1.21	0.000
23.250	1.21	3.99	1.20	0.000
23.333	1.20	3.96	1.20	0.000
23.417	1.19	3.93	1.19	0.000
23.500	1.18	3.90	1.18	0.000
23.583	1.17	3.88	1.17	0.000
23.667	1.16	3.85	1.16	0.000
23.750	1.15	3.82	1.15	0.000
23.833	1.15	3.80	1.15	0.000
23.917	1.14	3.77	1.14	0.000
24.000	1.13	3.75	1.13	0.000
24.083	1.12	3.71	1.12	0.000
24.167	1.07	3.55	1.11	0.000
24.250	0.96	3.19	1.03	0.000
24.333	0.81	2.68	0.85	0.000
24.417	0.66	2.19	0.88	0.000
24.500	0.53	1.76	0.59	0.000
24.583	0.43	1.42	0.36	0.000
24.667	0.34	1.14	0.52	0.000
24.750	0.28	0.91	0.29	0.000
24.833	0.22	0.73	0.24	0.000
24.917	0.18	0.59	0.30	0.000
25.000	0.14	0.50	0.13	0.000
25.083	0.11	0.50	0.22	0.000
25.167	0.09	0.50	0.12	0.000
25.250	0.07	0.50	0.09	0.000
25.333	0.06	0.50	0.19	0.000
25.417	0.05	0.50	0.00	0.000
25.500	0.04	0.50	0.15	0.000
25.583	0.03	0.50	0.07	0.000
25.667	0.02	0.50	0.00	0.000
25.750	0.02	0.50	0.11	0.000
25.833	0.02	0.50	0.07	0.000

25.917	0.01	0.50	0.00	0.000
26.000	0.01	0.50	0.11	0.000
26.083	0.01	0.50	0.12	0.000
26.167	0.01	0.50	0.10	0.000
26.250	0.01	0.50	0.08	0.000
26.333	0.00	0.50	0.06	0.000
26.417	0.00	0.50	0.05	0.000
26.500	0.00	0.50	0.04	0.000
26.583	0.00	0.50	0.03	0.000
26.667	0.00	0.50	0.03	0.000
26.750	0.00	0.50	0.02	0.000
26.833	0.00	0.50	0.02	0.000
26.917	0.00	0.00	0.01	0.000
27.000	0.00	0.00	0.01	0.000
27.083	0.00	0.00	0.01	0.000
27.167	0.00	0.00	0.01	0.000
27.250	0.00	0.00	0.01	0.000
27.333	0.00	0.00	0.00	0.000
27.417	0.00	0.00	0.00	0.000
27.500	0.00	0.00	0.00	0.000
27.583	0.00	0.00	0.00	0.000
27.667	0.00	0.00	0.00	0.000
27.750	0.00	0.00	0.00	0.000
27.833	0.00	0.00	0.00	0.000
27.917	0.00	0.00	0.00	0.000
28.000	0.00	0.00	0.00	0.000
28.083	0.00	0.00	0.00	0.000
28.167	0.00	0.00	0.00	0.000
28.250	0.00	0.00	0.00	0.000
28.333	0.00	0.00	0.00	0.000
28.417	0.00	0.00	0.00	0.000
28.500	0.00	0.00	0.00	0.000
28.583	0.00	0.00	0.00	0.000
28.667	0.00	0.00	0.00	0.000
28.750	0.00	0.00	0.00	0.000
28.833	0.00	0.00	0.00	0.000
28.917	0.00	0.00	0.00	0.000
29.000	0.00	0.00	0.00	0.000
29.083	0.00	0.00	0.00	0.000
29.167	0.00	0.00	0.00	0.000
29.250	0.00	0.00	0.00	0.000
29.333	0.00	0.00	0.00	0.000
29.417	0.00	0.00	0.00	0.000
29.500	0.00	0.00	0.00	0.000
29.583	0.00	0.00	0.00	0.000
29.667	0.00	0.00	0.00	0.000
29.750	0.00	0.00	0.00	0.000
29.833	0.00	0.00	0.00	0.000
29.917	0.00	0.00	0.00	0.000
30.000	0.00	0.00	0.00	0.000

30.083	0.00	0.00	0.00	0.000
30.167	0.00	0.00	0.00	0.000
30.250	0.00	0.00	0.00	0.000
30.333	0.00	0.00	0.00	0.000
30.417	0.00	0.00	0.00	0.000
30.500	0.00	0.00	0.00	0.000
30.583	0.00	0.00	0.00	0.000
30.667	0.00	0.00	0.00	0.000
30.750	0.00	0.00	0.00	0.000
30.833	0.00	0.00	0.00	0.000
30.917	0.00	0.00	0.00	0.000
31.000	0.00	0.00	0.00	0.000
31.083	0.00	0.00	0.00	0.000
31.167	0.00	0.00	0.00	0.000
31.250	0.00	0.00	0.00	0.000
31.333	0.00	0.00	0.00	0.000
31.417	0.00	0.00	0.00	0.000
31.500	0.00	0.00	0.00	0.000
31.583	0.00	0.00	0.00	0.000
31.667	0.00	0.00	0.00	0.000
31.750	0.00	0.00	0.00	0.000
31.833	0.00	0.00	0.00	0.000
31.917	0.00	0.00	0.00	0.000
32.000	0.00	0.00	0.00	0.000
32.083	0.00	0.00	0.00	0.000
32.167	0.00	0.00	0.00	0.000
32.250	0.00	0.00	0.00	0.000
32.333	0.00	0.00	0.00	0.000
32.417	0.00	0.00	0.00	0.000
32.500	0.00	0.00	0.00	0.000
32.583	0.00	0.00	0.00	0.000
32.667	0.00	0.00	0.00	0.000
32.750	0.00	0.00	0.00	0.000
32.833	0.00	0.00	0.00	0.000
32.917	0.00	0.00	0.00	0.000
33.000	0.00	0.00	0.00	0.000
33.083	0.00	0.00	0.00	0.000
33.167	0.00	0.00	0.00	0.000
33.250	0.00	0.00	0.00	0.000
33.333	0.00	0.00	0.00	0.000
33.417	0.00	0.00	0.00	0.000
33.500	0.00	0.00	0.00	0.000
33.583	0.00	0.00	0.00	0.000
33.667	0.00	0.00	0.00	0.000
33.750	0.00	0.00	0.00	0.000
33.833	0.00	0.00	0.00	0.000
33.917	0.00	0.00	0.00	0.000
34.000	0.00	0.00	0.00	0.000
34.083	0.00	0.00	0.00	0.000
34.167	0.00	0.00	0.00	0.000

34.250	0.00	0.00	0.00	0.000
34.333	0.00	0.00	0.00	0.000
34.417	0.00	0.00	0.00	0.000
34.500	0.00	0.00	0.00	0.000
34.583	0.00	0.00	0.00	0.000
34.667	0.00	0.00	0.00	0.000
34.750	0.00	0.00	0.00	0.000
34.833	0.00	0.00	0.00	0.000
34.917	0.00	0.00	0.00	0.000
35.000	0.00	0.00	0.00	0.000
35.083	0.00	0.00	0.00	0.000
35.167	0.00	0.00	0.00	0.000
35.250	0.00	0.00	0.00	0.000
35.333	0.00	0.00	0.00	0.000
35.417	0.00	0.00	0.00	0.000
35.500	0.00	0.00	0.00	0.000
35.583	0.00	0.00	0.00	0.000
35.667	0.00	0.00	0.00	0.000
35.750	0.00	0.00	0.00	0.000
35.833	0.00	0.00	0.00	0.000
35.917	0.00	0.00	0.00	0.000
36.000	0.00	0.00	0.00	0.000

FLOW PROCESS FROM NODE 4.00 TO NODE 4.00 IS CODE = 11

>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<

STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	7.5	15.0	22.5	30.0
0.083	0.0000	0.00	Q	.	.	.	.
0.167	0.0000	0.00	Q	.	.	.	.
0.250	0.0000	0.00	Q	.	.	.	.
0.333	0.0000	0.00	Q	.	.	.	.
0.417	0.0000	0.00	Q	.	.	.	.
0.500	0.0000	0.00	Q	.	.	.	.
0.583	0.0000	0.00	Q	.	.	.	.
0.667	0.0000	0.00	Q	.	.	.	.
0.750	0.0065	0.95	VQ	.	.	.	.
0.833	0.0159	1.37	VQ	.	.	.	.
0.917	0.0230	1.03	VQ	.	.	.	.
1.000	0.0298	0.99	VQ	.	.	.	.
1.083	0.0373	1.09	VQ	.	.	.	.
1.167	0.0446	1.06	VQ	.	.	.	.
1.250	0.0527	1.17	VQ	.	.	.	.

1.333	0.0601	1.09	VQ	.	.	.	.
1.417	0.0675	1.07	VQ	.	.	.	.
1.500	0.0750	1.08	VQ	.	.	.	.
1.583	0.0825	1.09	VQ	.	.	.	.
1.667	0.0901	1.10	VQ	.	.	.	.
1.750	0.0977	1.11	VQ	.	.	.	.
1.833	0.1054	1.12	VQ	.	.	.	.
1.917	0.1131	1.12	VQ	.	.	.	.
2.000	0.1209	1.13	VQ	.	.	.	.
2.083	0.1287	1.13	VQ	.	.	.	.
2.167	0.1365	1.14	.Q	.	.	.	.
2.250	0.1444	1.14	.Q	.	.	.	.
2.333	0.1523	1.15	.Q	.	.	.	.
2.417	0.1603	1.15	.Q	.	.	.	.
2.500	0.1683	1.16	.Q	.	.	.	.
2.583	0.1763	1.16	.Q	.	.	.	.
2.667	0.1843	1.17	.Q	.	.	.	.
2.750	0.1924	1.17	.Q	.	.	.	.
2.833	0.2005	1.18	.Q	.	.	.	.
2.917	0.2086	1.18	.Q	.	.	.	.
3.000	0.2168	1.18	.Q	.	.	.	.
3.083	0.2250	1.19	.Q	.	.	.	.
3.167	0.2332	1.19	.Q	.	.	.	.
3.250	0.2414	1.20	.Q	.	.	.	.
3.333	0.2497	1.20	.Q	.	.	.	.
3.417	0.2580	1.21	.Q	.	.	.	.
3.500	0.2664	1.21	.Q	.	.	.	.
3.583	0.2748	1.22	.QV	.	.	.	.
3.667	0.2832	1.22	.QV	.	.	.	.
3.750	0.2916	1.23	.QV	.	.	.	.
3.833	0.3001	1.23	.QV	.	.	.	.
3.917	0.3086	1.23	.QV	.	.	.	.
4.000	0.3171	1.24	.QV	.	.	.	.
4.083	0.3257	1.24	.QV	.	.	.	.
4.167	0.3343	1.25	.QV	.	.	.	.
4.250	0.3429	1.25	.QV	.	.	.	.
4.333	0.3516	1.26	.QV	.	.	.	.
4.417	0.3603	1.26	.QV	.	.	.	.
4.500	0.3690	1.27	.QV	.	.	.	.
4.583	0.3778	1.27	.QV	.	.	.	.
4.667	0.3866	1.28	.QV	.	.	.	.
4.750	0.3955	1.28	.QV	.	.	.	.
4.833	0.4043	1.29	.QV	.	.	.	.
4.917	0.4133	1.30	.Q V	.	.	.	.
5.000	0.4222	1.30	.Q V	.	.	.	.
5.083	0.4312	1.31	.Q V	.	.	.	.
5.167	0.4402	1.31	.Q V	.	.	.	.
5.250	0.4493	1.32	.Q V	.	.	.	.
5.333	0.4584	1.32	.Q V	.	.	.	.
5.417	0.4676	1.33	.Q V	.	.	.	.

5.500	0.4768	1.33	.Q V	.	.	.	.
5.583	0.4860	1.34	.Q V	.	.	.	.
5.667	0.4953	1.35	.Q V	.	.	.	.
5.750	0.5046	1.35	.Q V	.	.	.	.
5.833	0.5139	1.36	.Q V	.	.	.	.
5.917	0.5233	1.36	.Q V	.	.	.	.
6.000	0.5328	1.37	.Q V	.	.	.	.
6.083	0.5423	1.38	.Q V	.	.	.	.
6.167	0.5518	1.38	.Q V	.	.	.	.
6.250	0.5614	1.39	.Q V	.	.	.	.
6.333	0.5710	1.40	.Q V	.	.	.	.
6.417	0.5806	1.40	.Q V	.	.	.	.
6.500	0.5903	1.41	.Q V	.	.	.	.
6.583	0.6001	1.42	.Q V	.	.	.	.
6.667	0.6099	1.42	.Q V	.	.	.	.
6.750	0.6198	1.43	.Q V	.	.	.	.
6.833	0.6297	1.44	.Q V	.	.	.	.
6.917	0.6396	1.44	.Q V	.	.	.	.
7.000	0.6496	1.45	.Q V	.	.	.	.
7.083	0.6596	1.46	.Q V	.	.	.	.
7.167	0.6697	1.46	.Q V	.	.	.	.
7.250	0.6798	1.47	.Q V	.	.	.	.
7.333	0.6899	1.47	.Q V	.	.	.	.
7.417	0.7002	1.48	.Q V	.	.	.	.
7.500	0.7104	1.49	.Q V	.	.	.	.
7.583	0.7207	1.50	.Q V	.	.	.	.
7.667	0.7311	1.51	. Q V	.	.	.	.
7.750	0.7415	1.51	. Q V	.	.	.	.
7.833	0.7520	1.52	. Q V	.	.	.	.
7.917	0.7626	1.53	. Q V	.	.	.	.
8.000	0.7732	1.54	. Q V	.	.	.	.
8.083	0.7839	1.55	. Q V	.	.	.	.
8.167	0.7946	1.56	. Q V	.	.	.	.
8.250	0.8054	1.57	. Q V	.	.	.	.
8.333	0.8162	1.58	. Q V	.	.	.	.
8.417	0.8271	1.58	. Q V	.	.	.	.
8.500	0.8381	1.59	. Q V	.	.	.	.
8.583	0.8492	1.61	. Q V	.	.	.	.
8.667	0.8604	1.62	. Q V	.	.	.	.
8.750	0.8716	1.64	. Q V	.	.	.	.
8.833	0.8830	1.65	. Q V	.	.	.	.
8.917	0.8945	1.66	. Q V	.	.	.	.
9.000	0.9060	1.67	. Q V	.	.	.	.
9.083	0.9176	1.69	. Q V	.	.	.	.
9.167	0.9293	1.70	. Q V	.	.	.	.
9.250	0.9411	1.71	. Q V	.	.	.	.
9.333	0.9529	1.72	. Q V	.	.	.	.
9.417	0.9649	1.73	. Q V	.	.	.	.
9.500	0.9769	1.75	. Q V	.	.	.	.
9.583	0.9890	1.76	. Q V	.	.	.	.

9.667	1.0012	1.77	. Q	V	.	.	.
9.750	1.0135	1.78	. Q	V	.	.	.
9.833	1.0258	1.80	. Q	V	.	.	.
9.917	1.0383	1.81	. Q	V	.	.	.
10.000	1.0509	1.82	. Q	V	.	.	.
10.083	1.0635	1.84	. Q	V	.	.	.
10.167	1.0762	1.85	. Q	V	.	.	.
10.250	1.0891	1.87	. Q	V	.	.	.
10.333	1.1020	1.88	. Q	V	.	.	.
10.417	1.1151	1.89	. Q	V	.	.	.
10.500	1.1282	1.91	. Q	V	.	.	.
10.583	1.1415	1.93	. Q	V	.	.	.
10.667	1.1549	1.94	. Q	V	.	.	.
10.750	1.1684	1.96	. Q	V	.	.	.
10.833	1.1820	1.98	. Q	V	.	.	.
10.917	1.1957	1.99	. Q	V	.	.	.
11.000	1.2095	2.01	. Q	V	.	.	.
11.083	1.2235	2.03	. Q	V	.	.	.
11.167	1.2376	2.05	. Q	V.	.	.	.
11.250	1.2518	2.07	. Q	V.	.	.	.
11.333	1.2662	2.09	. Q	V.	.	.	.
11.417	1.2807	2.11	. Q	V.	.	.	.
11.500	1.2953	2.13	. Q	V.	.	.	.
11.583	1.3101	2.15	. Q	V.	.	.	.
11.667	1.3251	2.17	. Q	V.	.	.	.
11.750	1.3401	2.19	. Q	V.	.	.	.
11.833	1.3554	2.21	. Q	V.	.	.	.
11.917	1.3708	2.24	. Q	V	.	.	.
12.000	1.3864	2.26	. Q	V	.	.	.
12.083	1.4021	2.29	. Q	V	.	.	.
12.167	1.4181	2.32	. Q	V	.	.	.
12.250	1.4344	2.37	. Q	V	.	.	.
12.333	1.4515	2.47	. Q	V	.	.	.
12.417	1.4693	2.59	. Q	V	.	.	.
12.500	1.4879	2.69	. Q	V	.	.	.
12.583	1.5069	2.77	. Q	.V	.	.	.
12.667	1.5265	2.83	. Q	.V	.	.	.
12.750	1.5463	2.89	. Q	.V	.	.	.
12.833	1.5665	2.93	. Q	.V	.	.	.
12.917	1.5870	2.97	. Q	.V	.	.	.
13.000	1.6078	3.01	. Q	.V	.	.	.
13.083	1.6288	3.06	. Q	.V	.	.	.
13.167	1.6501	3.10	. Q	. V	.	.	.
13.250	1.6718	3.14	. Q	. V	.	.	.
13.333	1.6937	3.18	. Q	. V	.	.	.
13.417	1.7160	3.23	. Q	. V	.	.	.
13.500	1.7385	3.28	. Q	. V	.	.	.
13.583	1.7614	3.33	. Q	. V	.	.	.
13.667	1.7847	3.38	. Q	. V	.	.	.
13.750	1.8084	3.44	. Q	. V	.	.	.

13.833	1.8324	3.49	.	Q	.	V	.	.	.
13.917	1.8568	3.54	.	Q	.	V	.	.	.
14.000	1.8817	3.61	.	Q	.	V	.	.	.
14.083	1.9070	3.67	.	Q	.	V	.	.	.
14.167	1.9327	3.74	.	Q	.	V	.	.	.
14.250	1.9591	3.83	.	Q	.	V	.	.	.
14.333	1.9861	3.92	.	Q	.	V	.	.	.
14.417	2.0138	4.03	.	Q	.	V	.	.	.
14.500	2.0423	4.13	.	Q	.	V	.	.	.
14.583	2.0715	4.24	.	Q	.	V	.	.	.
14.667	2.1013	4.34	.	Q	.	V	.	.	.
14.750	2.1320	4.45	.	Q	.	V	.	.	.
14.833	2.1634	4.57	.	Q	.	V	.	.	.
14.917	2.1957	4.69	.	Q	.	V	.	.	.
15.000	2.2290	4.83	.	Q	.	V	.	.	.
15.083	2.2633	4.98	.	Q	.	V	.	.	.
15.167	2.2987	5.14	.	Q	.	V	.	.	.
15.250	2.3354	5.32	.	Q	.	V	.	.	.
15.333	2.3734	5.52	.	Q	.	V	.	.	.
15.417	2.4130	5.75	.	Q	.	V	.	.	.
15.500	2.4545	6.02	.	Q	.	V	.	.	.
15.583	2.4987	6.42	.	Q	.	V	.	.	.
15.667	2.5467	6.97	.	Q	.	V	.	.	.
15.750	2.5991	7.60	.	Q	.	V	.	.	.
15.833	2.6560	8.27	.	.Q	.	V	.	.	.
15.917	2.7178	8.97	.	.Q	.	V	.	.	.
16.000	2.7875	10.13	.	.	Q	V	.	.	.
16.083	2.8738	12.53	.	.	.	Q	.V	.	.
16.167	2.9959	17.73	.	.	.	.	VQ	.	.
16.250	3.1679	24.98	.	.	.	.	V	.	Q
16.333	3.3674	28.97	.	.	.	.	V	.	Q
16.417	3.5669	28.97	.	.	.	.	V	.	Q
16.500	3.7410	25.28	.	.	.	.	V	.	Q
16.583	3.8691	18.59	.	.	.	Q	V	.	.
16.667	3.9654	14.00	.	.	Q	.	V	.	.
16.750	4.0417	11.08	.	.	Q	.	V	.	.
16.833	4.1036	8.99	.	.Q	.	.	V	.	.
16.917	4.1553	7.51	.	Q	.	.	V	.	.
17.000	4.2004	6.54	.	Q	.	.	V	.	.
17.083	4.2409	5.88	.	Q	.	.	.V	.	.
17.167	4.2781	5.40	.	Q	.	.	.V	.	.
17.250	4.3127	5.01	.	Q	.	.	.V	.	.
17.333	4.3450	4.69	.	Q	.	.	.V	.	.
17.417	4.3753	4.40	.	Q	.	.	.V	.	.
17.500	4.4039	4.16	.	Q	.	.	.V	.	.
17.583	4.4312	3.96	.	Q	.	.	.V	.	.
17.667	4.4573	3.79	.	Q	.	.	.V	.	.
17.750	4.4823	3.64	.	Q	.	.	.V	.	.
17.833	4.5066	3.51	.	Q	.	.	.V	.	.
17.917	4.5302	3.43	.	Q	.	.	.V	.	.

18.000	4.5528	3.29	.	Q	.	.	.	V	.
18.083	4.5748	3.20	.	Q	.	.	.	V	.
18.167	4.5962	3.11	.	Q	.	.	.	V	.
18.250	4.6169	3.00	.	Q	.	.	.	V	.
18.333	4.6365	2.85	.	Q	.	.	.	V	.
18.417	4.6550	2.68	.	Q	.	.	.	V	.
18.500	4.6726	2.56	.	Q	.	.	.	V	.
18.583	4.6895	2.46	.	Q	.	.	.	V	.
18.667	4.7058	2.37	.	Q	.	.	.	V	.
18.750	4.7217	2.30	.	Q	.	.	.	V	.
18.833	4.7371	2.24	.	Q	.	.	.	V	.
18.917	4.7522	2.19	.	Q	.	.	.	V	.
19.000	4.7670	2.14	.	Q	.	.	.	V	.
19.083	4.7814	2.10	.	Q	.	.	.	V	.
19.167	4.7955	2.06	.	Q	.	.	.	V	.
19.250	4.8094	2.02	.	Q	.	.	.	V	.
19.333	4.8231	1.98	.	Q	.	.	.	V	.
19.417	4.8365	1.95	.	Q	.	.	.	V	.
19.500	4.8497	1.92	.	Q	.	.	.	V	.
19.583	4.8627	1.89	.	Q	.	.	.	V	.
19.667	4.8755	1.86	.	Q	.	.	.	V	.
19.750	4.8881	1.83	.	Q	.	.	.	V	.
19.833	4.9005	1.80	.	Q	.	.	.	V	.
19.917	4.9127	1.78	.	Q	.	.	.	V	.
20.000	4.9248	1.75	.	Q	.	.	.	V	.
20.083	4.9367	1.73	.	Q	.	.	.	V	.
20.167	4.9484	1.70	.	Q	.	.	.	V	.
20.250	4.9600	1.68	.	Q	.	.	.	V	.
20.333	4.9714	1.66	.	Q	.	.	.	V	.
20.417	4.9827	1.64	.	Q	.	.	.	V	.
20.500	4.9939	1.62	.	Q	.	.	.	V	.
20.583	5.0049	1.60	.	Q	.	.	.	V	.
20.667	5.0158	1.59	.	Q	.	.	.	V	.
20.750	5.0267	1.58	.	Q	.	.	.	V	.
20.833	5.0375	1.56	.	Q	.	.	.	V	.
20.917	5.0482	1.55	.	Q	.	.	.	V	.
21.000	5.0588	1.54	.	Q	.	.	.	V	.
21.083	5.0693	1.52	.	Q	.	.	.	V	.
21.167	5.0796	1.51	.	Q	.	.	.	V	.
21.250	5.0899	1.50	.	Q	.	.	.	V	.
21.333	5.1001	1.48	.	Q	.	.	.	V	.
21.417	5.1103	1.47	.	Q	.	.	.	V	.
21.500	5.1203	1.45	.	Q	.	.	.	V	.
21.583	5.1301	1.43	.	Q	.	.	.	V	.
21.667	5.1398	1.41	.	Q	.	.	.	V	.
21.750	5.1495	1.40	.	Q	.	.	.	V	.
21.833	5.1590	1.39	.	Q	.	.	.	V	.
21.917	5.1685	1.37	.	Q	.	.	.	V	.
22.000	5.1778	1.36	.	Q	.	.	.	V	.
22.083	5.1871	1.35	.	Q	.	.	.	V	.

22.167	5.1963	1.34	.Q	.	.	.	V .
22.250	5.2055	1.33	.Q	.	.	.	V .
22.333	5.2145	1.31	.Q	.	.	.	V .
22.417	5.2235	1.30	.Q	.	.	.	V .
22.500	5.2324	1.29	.Q	.	.	.	V .
22.583	5.2412	1.28	.Q	.	.	.	V .
22.667	5.2500	1.27	.Q	.	.	.	V .
22.750	5.2587	1.26	.Q	.	.	.	V .
22.833	5.2673	1.25	.Q	.	.	.	V .
22.917	5.2759	1.24	.Q	.	.	.	V .
23.000	5.2843	1.23	.Q	.	.	.	V .
23.083	5.2928	1.22	.Q	.	.	.	V .
23.167	5.3011	1.21	.Q	.	.	.	V .
23.250	5.3094	1.20	.Q	.	.	.	V .
23.333	5.3177	1.20	.Q	.	.	.	V .
23.417	5.3258	1.19	.Q	.	.	.	V .
23.500	5.3340	1.18	.Q	.	.	.	V .
23.583	5.3420	1.17	.Q	.	.	.	V .
23.667	5.3500	1.16	.Q	.	.	.	V .
23.750	5.3580	1.15	.Q	.	.	.	V .
23.833	5.3659	1.15	.Q	.	.	.	V .
23.917	5.3737	1.14	.Q	.	.	.	V .
24.000	5.3815	1.13	.Q	.	.	.	V .
24.083	5.3893	1.12	.Q	.	.	.	V .
24.167	5.3969	1.11	.Q	.	.	.	V .
24.250	5.4040	1.03	.Q	.	.	.	V .
24.333	5.4098	0.85	.Q	.	.	.	V .
24.417	5.4159	0.88	.Q	.	.	.	V .
24.500	5.4199	0.59	Q	.	.	.	V .
24.583	5.4224	0.36	Q	.	.	.	V .
24.667	5.4260	0.52	Q	.	.	.	V .
24.750	5.4280	0.29	Q	.	.	.	V .
24.833	5.4297	0.24	Q	.	.	.	V .
24.917	5.4318	0.30	Q	.	.	.	V .
25.000	5.4326	0.13	Q	.	.	.	V .
25.083	5.4342	0.22	Q	.	.	.	V .
25.167	5.4350	0.12	Q	.	.	.	V .
25.250	5.4356	0.09	Q	.	.	.	V .
25.333	5.4369	0.19	Q	.	.	.	V .
25.417	5.4369	0.00	Q	.	.	.	V .
25.500	5.4379	0.15	Q	.	.	.	V .
25.583	5.4384	0.07	Q	.	.	.	V .
25.667	5.4384	0.00	Q	.	.	.	V .
25.750	5.4392	0.11	Q	.	.	.	V .
25.833	5.4397	0.07	Q	.	.	.	V .
25.917	5.4397	0.00	Q	.	.	.	V .
26.000	5.4404	0.11	Q	.	.	.	V .
26.083	5.4413	0.12	Q	.	.	.	V .
26.167	5.4419	0.10	Q	.	.	.	V .
26.250	5.4424	0.08	Q	.	.	.	V .

26.333	5.4429	0.06	Q	.	.	.	V.
26.417	5.4432	0.05	Q	.	.	.	V.
26.500	5.4435	0.04	Q	.	.	.	V.
26.583	5.4437	0.03	Q	.	.	.	V.
26.667	5.4439	0.03	Q	.	.	.	V.
26.750	5.4440	0.02	Q	.	.	.	V.
26.833	5.4441	0.02	Q	.	.	.	V.
26.917	5.4442	0.01	Q	.	.	.	V.
27.000	5.4443	0.01	Q	.	.	.	V.
27.083	5.4443	0.01	Q	.	.	.	V.

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%	1625.0
10%	330.0
20%	100.0
30%	60.0
40%	40.0
50%	30.0
60%	30.0
70%	20.0
80%	20.0
90%	10.0

=====

END OF FLOODSCx ROUTING ANALYSIS